Technical Scrapbook, Cat. 1149

This scrapbook covers the period January-December 1883. The entries are by Edison and relate primarily to electric lighting. Included are notes and drawings concerning lamps, generators, meters, regulators, electric power distribution, and other parts of the system. Many of the entries contain notes by Edison to Richard N. Dyer, his patent attorney. The case number of Edison's patent application has been written on some of the items.

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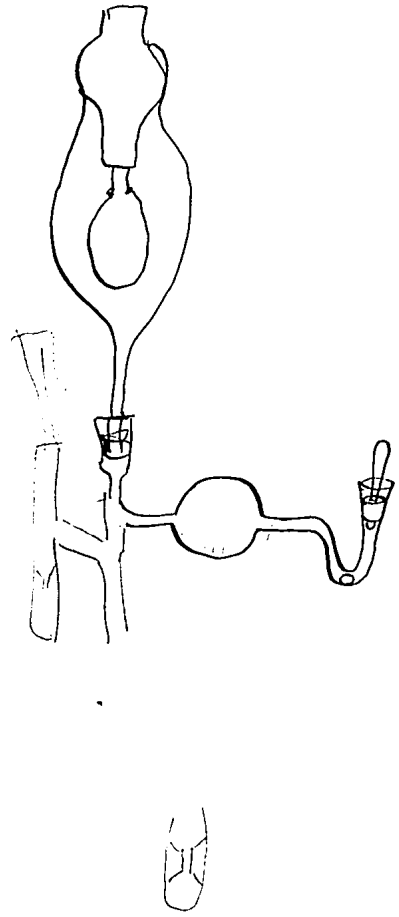

Capsule of gelatine, Enclosing a volatile compound Carbon — the capsule is melted & allows the escape of the liquid into the vacuum in the proper quantity. Collodion, Tragacanth, flour paste etc, & other sub-

New York Jan. 2, 1883

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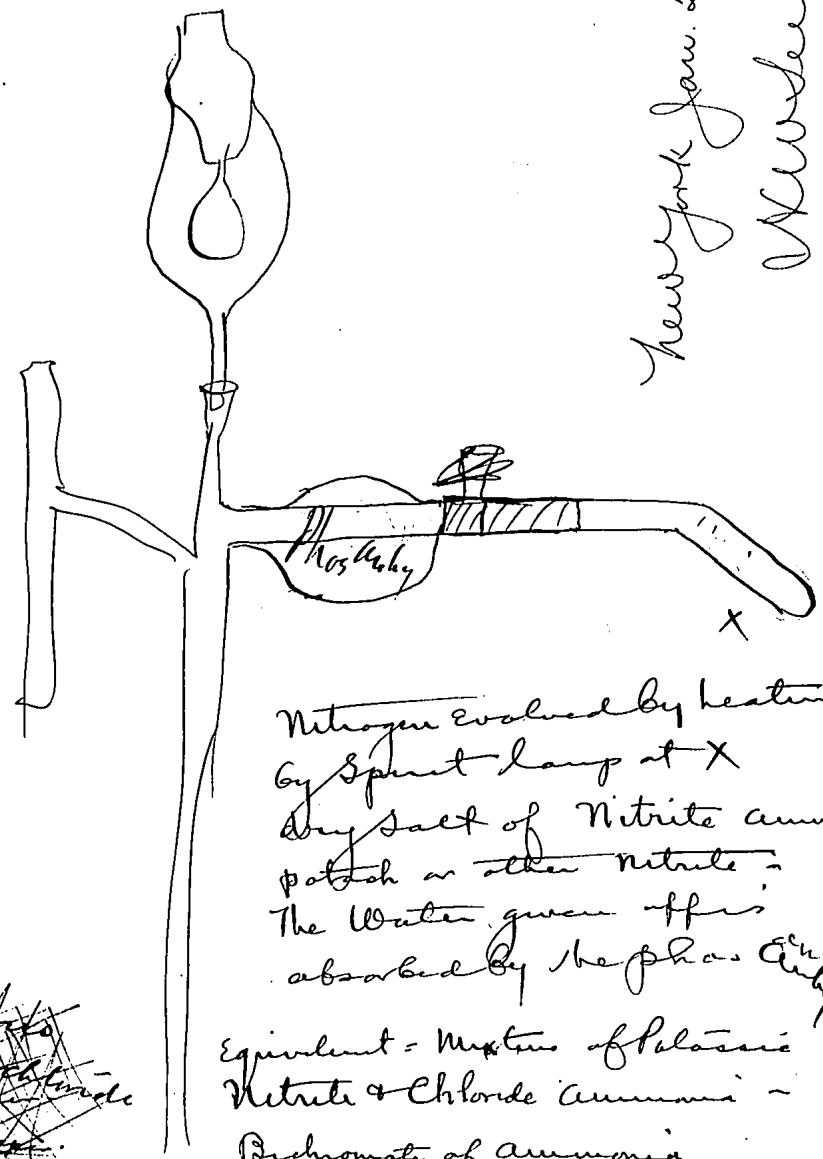
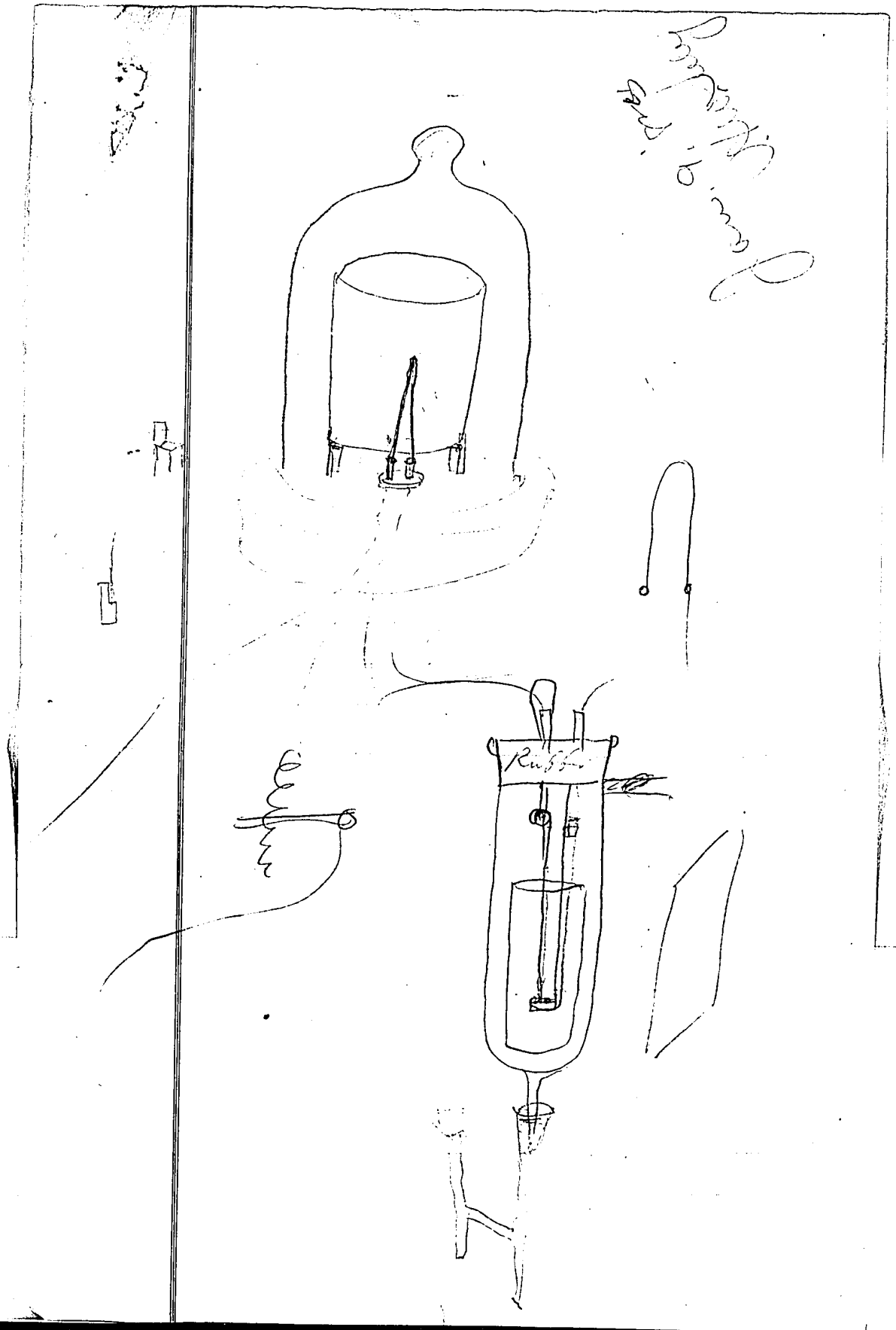


Nitrogen evolved by heating
by Spirit lamp at X
Dry salt of Nitrite ammonia
potash or other nitrite –
The Water given off is
absorbed by the phos. anhydride

Equivalent = Mixture of Potassic
Nitrite & Chloride ammonia –

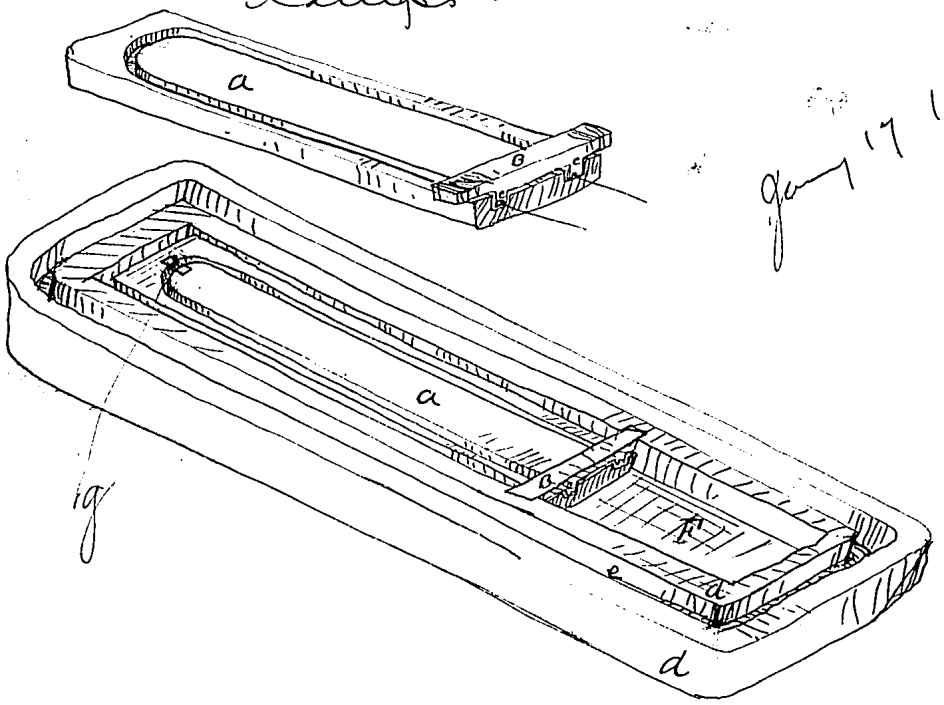
Bichromate of ammonia
Nitrite of Chromium

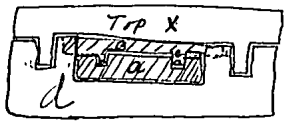
January 1883

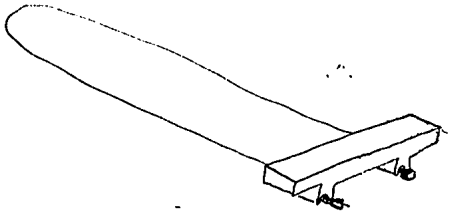


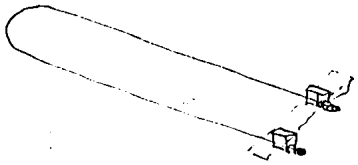
a is a long form with a groove ~~cut~~ moulded in it into which is laid the filament to be carbonized. The ~~ex~~ ends of the filament are secured to the projecting pins c which are a part of the fixed bridge B. the broadened or thickened end of the filament laying in a groove in the pin c. The form a being movable as the filament carbonizes it contracts & pulls the form along the space F. The space being sufficient to allow for the whole contraction of the filament & the form being sufficiently heavy puts the right strain upon the filament in the act of carbonizing. d is the mould. x The top = the cap set ~~on~~ of the ~~double~~ gutter being to prevent access of oxygen which impairs the perfection of very fine filaments by oxidation. The whole you see is a regular closed chamber & ~~the~~ number of these are laid one on the other & placed in a ~~mass~~ large ~~Ete~~ Seely see my application of carbonizing in double plumbago covers ~~Ete~~ ~~claim the mould~~ You will have to look at the other patent to get claims

New Carbon form for Carbonizing delicate filaments of Carbon for incandescent lamps —









Jany 17 1883

The object of the invention is to automatically ~~that~~ maintain a balance or equilibrium in the number of lamps between two circuits

The invention consists in the same

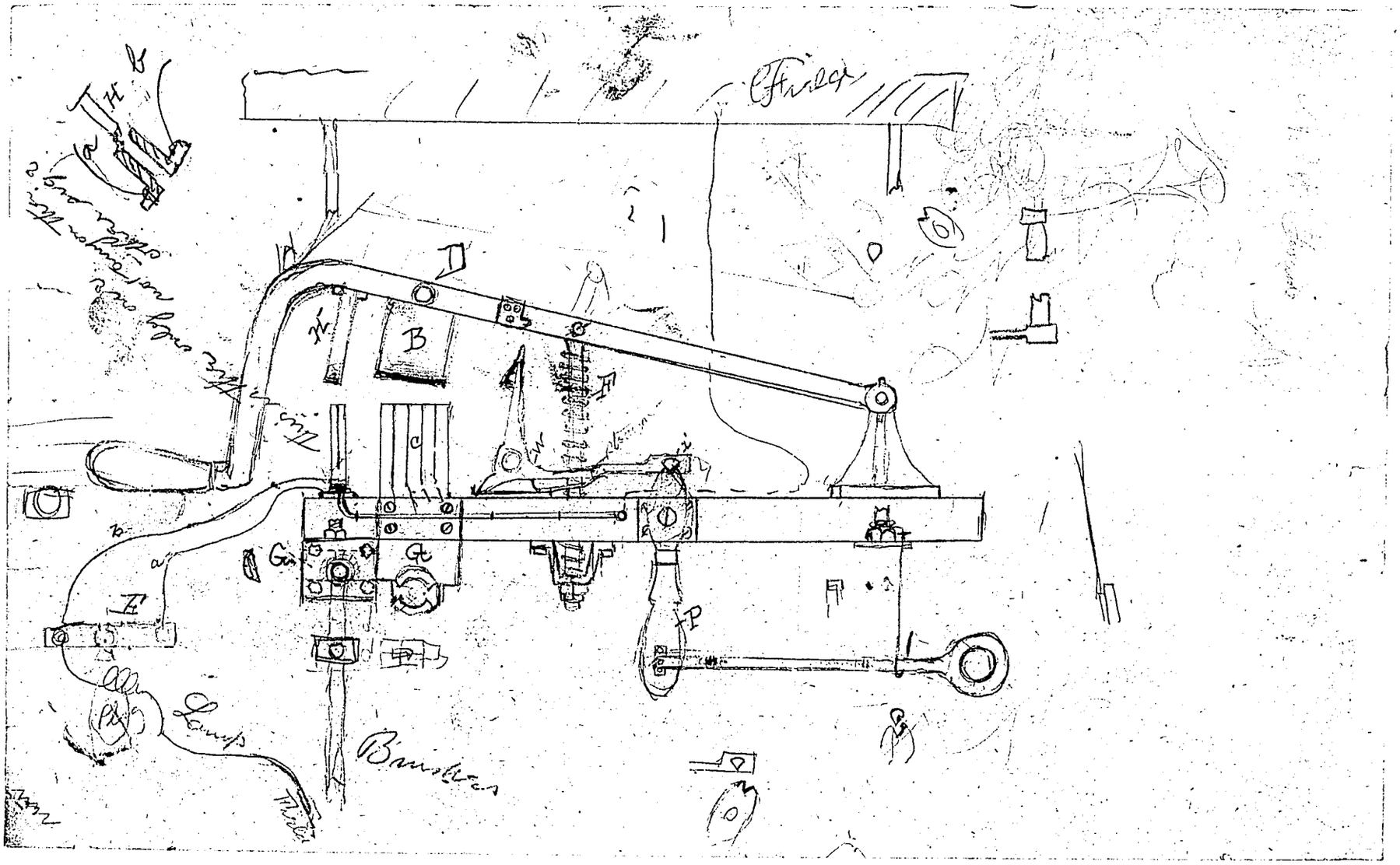
A.Y.B. are double Electromagnets one magnet being placed across one circuit & the other across the other circuit, when there is the same EMF across the terminals of each circuit the lever of the Electromagnet is ~~at~~ is constantly attracted to that side which it had been previously attracted by reason of a discrepancy of EMF - while in this position the lever & contacts put its multiple arc circuit of lamps across say the No 1 circuit now if No 1 circuit is weakened (10) the EMF falls due to heavy loading on that side, the magnet weakens across that circuit and as the No 2 is overload in EMF the lever is attracted to the other side & this throws the circuit of lamps across No 2 raising the EMF of No 1 & lowering that of No 2 & by having say an automatic Galvanometer device in every 10th house the moment any tendency of overloading one circuit occurs some of the automatic devices will throw lamps from the circuit to the other side

until equilibrium is attained - with these devices the cells were ~~[illegible]~~ need not pass to the solution but it is preferable & by its use the number of automatic devices can be greatly lessened. When there are a great number of consumers the automatic device is of comparatively little but is valuable where there are but few consumers & occasions arise where the currents are very much out of balance hence there is a large drop of pressure in the conductors & the lamps show great discrimination in the brilliancy & this is corrected by an automatic balancing device or compensator.

A clockwork to shift the currents of lamps from one set to the other could be used which is controlled by a differential magnet. The expansion of wire deflection of galvanometer expansion of air mechanism controlled by magnetism, or electro tube deposition could readily be used to effect the shifting of the lamp current.

Seely make some broad claims on this

March 4 1883 E


Frame
B
C
G
G
P
Lamps
Brackets

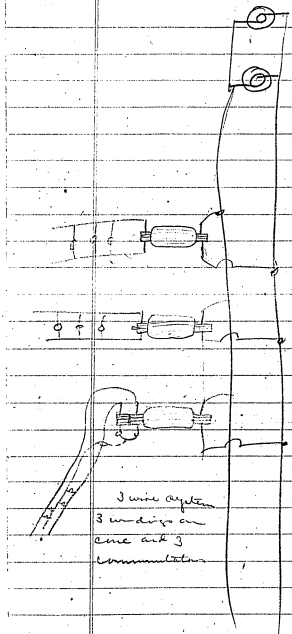
Circuit Preacher

Tribal Nation

1883

G.R.

— April 1883 —



New System
to take power from waterfall of Lake 10 miles, then distribute

Sig. Oct. 12. '83
Thackeray

3 arms of central station
insulated of each other, with very high resistance in primary are

Case on process

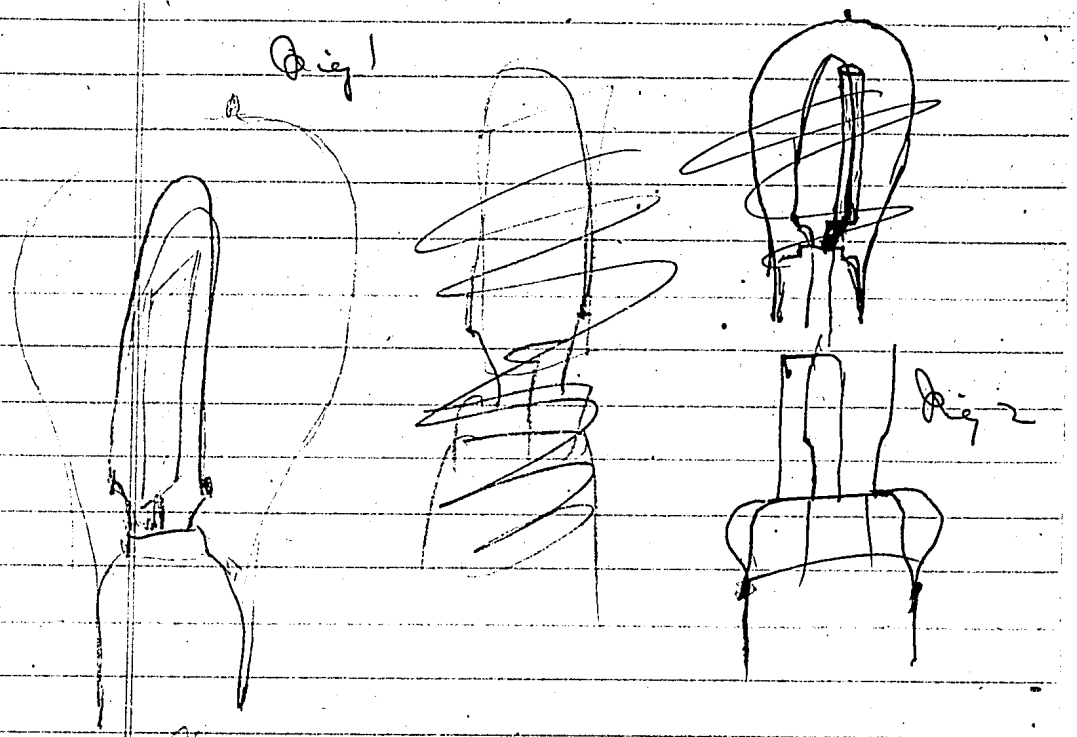
Filament first carbonized; then put in temporary vacuum chamber and sealed to incandescence; then taken out and dipped in carbonizable solution; then re-carbonized in furnace; then used in ordinary way.

Dilute up weak asphalt; no good unless set before dipping.

April 10, 83

[illegible]

April 1883

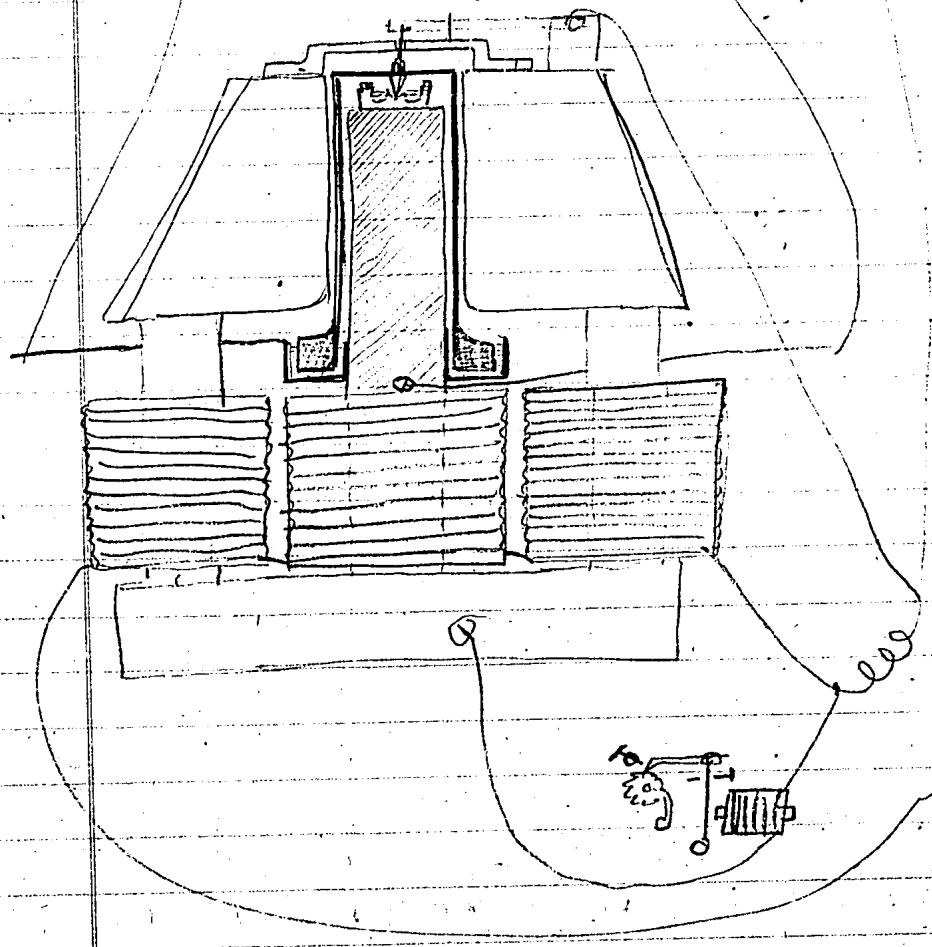


Caveat 107 — Fig. 3 — glass or mica between limbs of carbon or glass tube around one limb.

Prepare abstr.

Apl. 2d, 83

Fig 5



Motor

#3

Generator

May 7 83

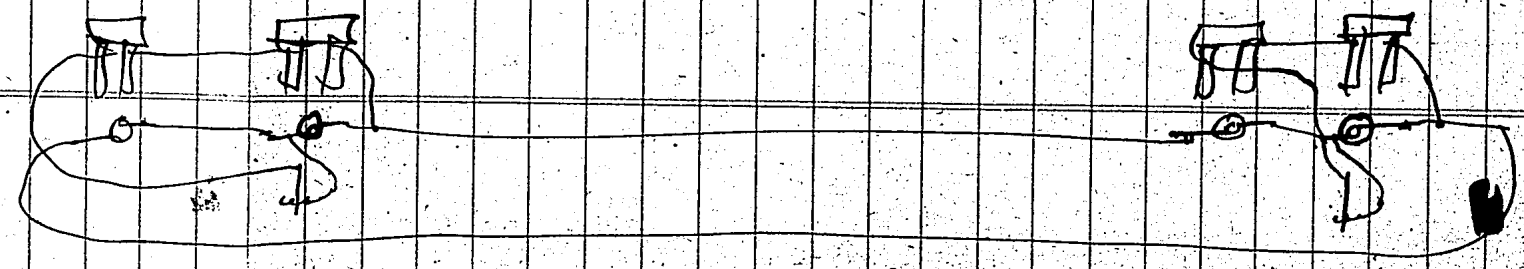
R.H.D.

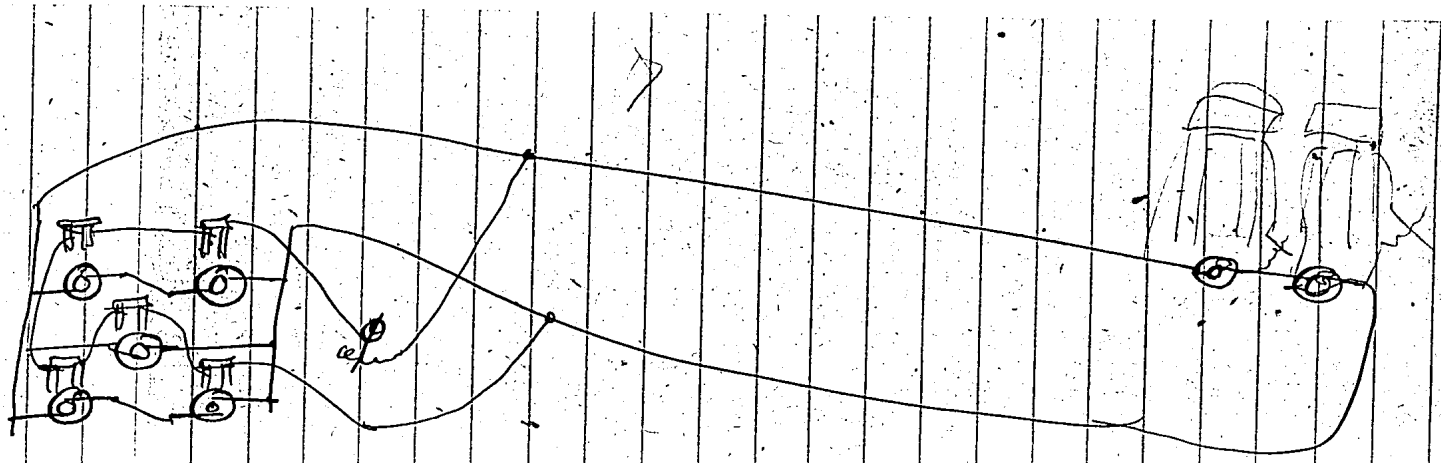
Motor

#3

Generator

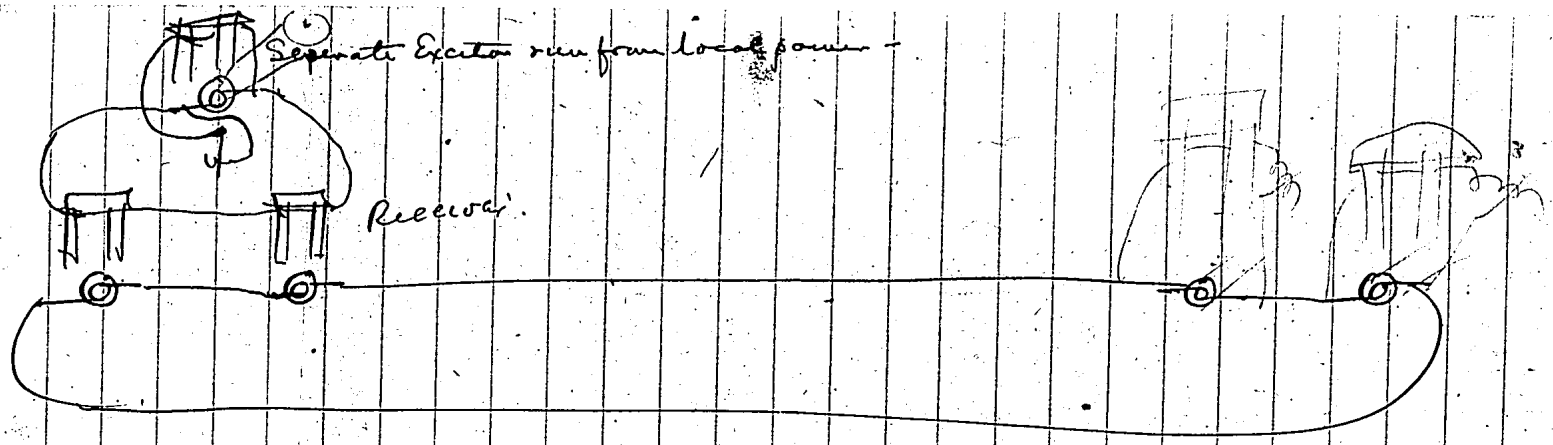
#4





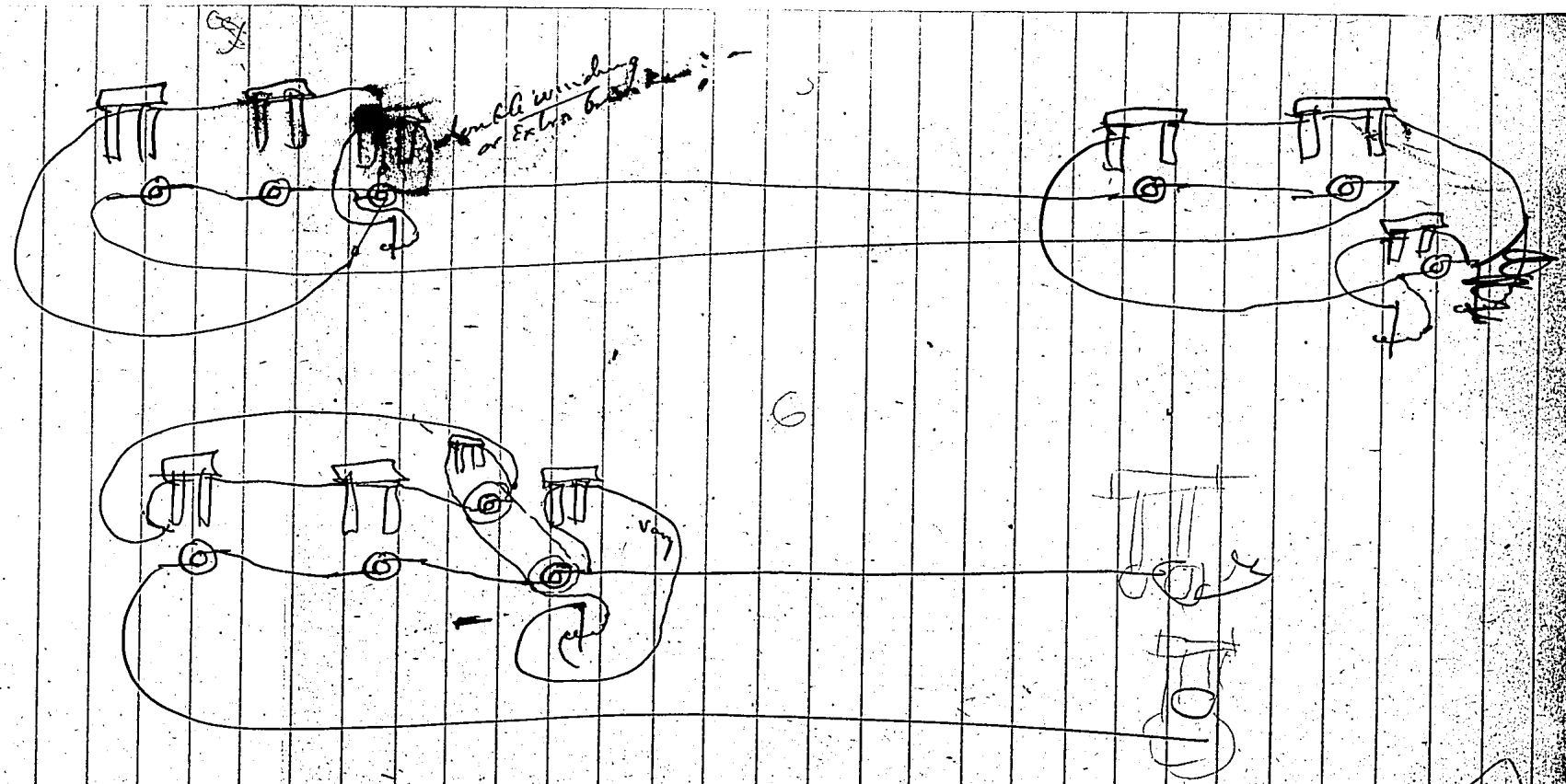
May 7 83

R.A.D.



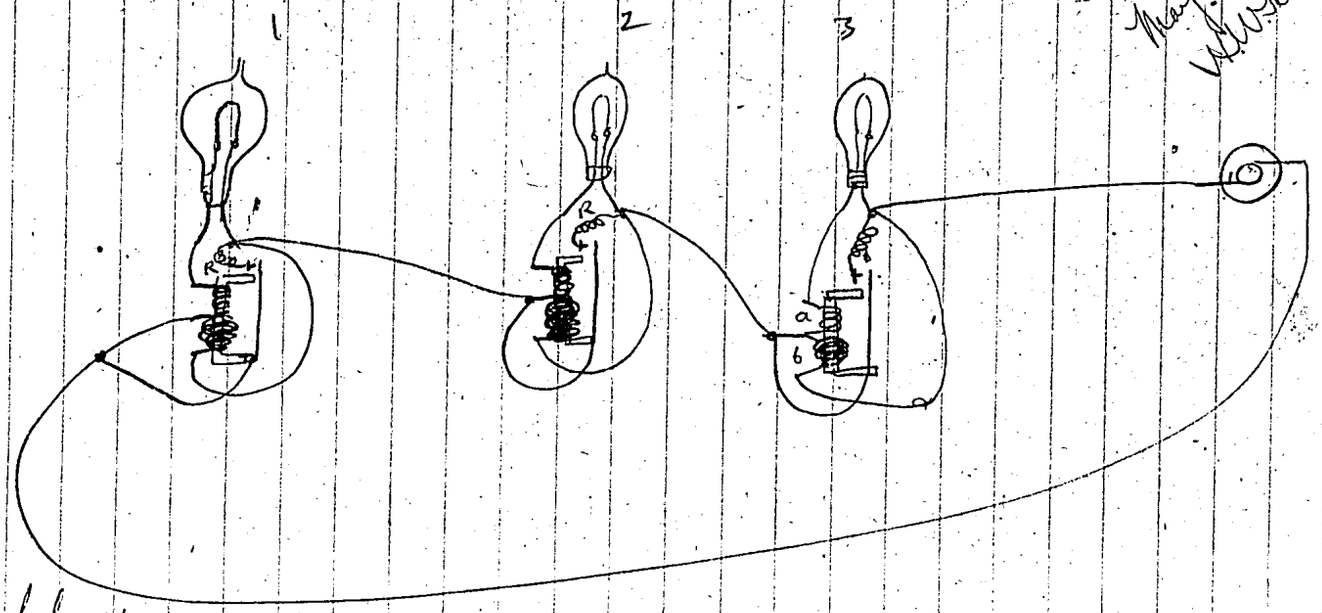
May 7. 83

R.A.D.



May 7 83

Mary Ann Williams
Exhibit 3
Ann after in Mine
100
200



May 31/83
W.H. Wheeler

Have anything like this.

Differential wound magnets when lamps are the current in low res coil a balance the magnetism produced by the current in the fine wire b. R is a low resistance or it may be another lamp — When the lamp 1 2 or 3 breaks the differential coil is disharged the armature of the magnet is attracted & the ~~[illegible]~~ coil R is thrown in circ't —

E

~~W.H. Wheeler~~

May 31 1883

T. 3

1

The object of this invention is to produce a cheap and reliable meter for measuring the Electric Current or Energy in a ~~gen~~ system of general distribution of Electricity for light heat & power.

The invention consists in combining a peculiar constructed Electrometer with the line upon which the current is to be measured & providing such meter with proper counting or registering apparatus and also devices for causing the meter to perform a definite amount of work.

~~The foregoing~~

Fig 1 shows a section of the meter –
B is the iron base which forms the back of the Electromagnet
C' being one pole, & C2 C3 forming with the end piece E F the other pole
~~C' C2 C3 are provided with~~
Coils of wire D' 2 & 3 are all placed in one circuit & this circuit forms a multiple arc circuit across the main conductors upon the consumer's premises

The direction of the current is such
E E are ~~both~~ positive which
C' opposite is negative;
thus the lines of force pass from
C' to E from the entire circumference
of C'
On the cap of C' is a depression
with a bearing into which a pivotal
point S runs, the depression is partially
filled with mercury. The point
S is made of platinum or
platinum Iridium alloy so as not
to amalgamate with the mercury
in the depression, the mercury
being used to make good
sufficient contact with the
revolving pivot to carry without
heating a powerful current
F is a copper cylinder to
which the pivot S is secured
This cylinder is shown in fig 2
at the bottom are several paddles
of platinum ~~[illegible]~~ which
rotate in the circular trough
E fig 2 which is partially
filled with mercury which
acts both to make electrical
contact with the cylinder
which is to be rotated upon

its pivot S. and also to cause a definite amount of work to be done by the cylinder in the act of rotating.
Another bearing N supports the extension of the pivot S. marked T. upon the extreme end of T is a worm which acting upon a worm wheel Q gives motion to the train of wheels which serves to register or indicate the number of revolutions of the cylinder F. the same as the counter used in a gas meter the revolutions being proportionate to the strength of the current. Instead of a worm & worm wheel the rotating cylinder & shaft may at each revolution close momentarily a local circuit & energize an electro magnet which serves to give motion to the indicating mechanism. This is shown in fig 4. T is the shaft W a point. P a platinum tipped spring. R a limiting point. at every revolution the point W comes into contact with the spring P & closes the circuit

4 to the magnet X.

The method of connecting the mechanism to the line is shewn in fig

L are the mains of the street
PN the mains on the house,
wire 1 runs to RR which is a resonance coil, thence to the helix D' thence through helix D² thence through the helix D³ back by wire 2 to the other pole
Thus keeping a current constantly circulating around the coils of the field magnet –
The main line passes by wire 3 to the mercury in E thence up through the cylinder around its whole circumference to the piston S down through the iron core C' to the base thence by wire, 3 to the lamps –
When no lamps are in circuit only the field of force magnets are energized but the moment a lamp is placed across the circuit

or pole a powerful current passes through the meter as described & causes the cylinder to rotate. If now a 2nd lamp be placed across the pole twice as much current passes & the speed of rotation of the cylinder is doubled.
In fig 5 the electrical contact method of working the indicating apparatus is shown. The shaft T in rotating makes momentary contact with P once every revolution. This closes a local circuit around the resistance RR in which circuit is the magnet X.
That the rotating shell may so perform work so that the currents directly proportional to the rotation, the paddles upon the cylinder must be arranged in a proper manner, & retarding pieces may in some designs be found necessary. The retarding pieces being connected permanently with the circular trough so as to prevent the mercury rotating as a whole - again during

to the large size of a meter & the consequent large initial friction of the parts, it may be necessary to make the paddles connected with the cylinder loose but so arranged as to be thrown in or out of the mercury more or less so as to cause the rotations of the shell to be directly proportional to the strength of the current,

Parallelogram to prevent torsion of paddle shaft

It is not necessary that the shell should rotate as it may be held still & the magnet rotate as in fig 6

~~Even [illegible]~~

Even permanent magnets may be used & Electromagnets dispensed with,

To prevent waste of Electrical Energy by keeping the field of the magnets constantly charged when there is no lamps connected, an Electromagnet may be placed in circuit at X which having a lever & point

may serve to close the same when a lamp is connected, the points & lever being interpolated in the field of force circuit. The circuit is opened by the magnet only when ~~[illegible]~~ there are no lamps across the line.

Thus by the use of a non commutator motor or rather monodynamic motor I am enabled to convey powerful currents through the apparatus without loss by ~~rigid~~ solid metallic or multiple contacts and also to obtain slow rotations with powerful currents; and at the same time attain this result with exceedingly small indefinite friction ~~[illegible]~~

It is not essential to have an electromagnet field as the rotation of the cylinder will take place if a helix alone is used as in fig 7 but by the use of an iron armature less current is required to perform the work =

Claim.

A monodynamic Motor substantially as described

A monodynamic Motor sub as described for giving motion to recording or indicating apparatus.

A monodynamic motor sub as described having its moving or inductive parts interpolated in the circuit with the translating devices, and a constant magnetic field produced by the action of the current from a multiple arc ckt across the line,

A monodynamic motor without a commutator interpolated within the circuit the current of which circuit is to measure in combination with a magnetic or electric field of force, and recording or indicating apparatus.

a monodynamo motor arranged to perform a known & definite work in excess of the ~~f~~ normal friction of the motor ~~the~~ & actuated mechanism so as to cause the number of revolutions of such motor to bear a known relation to the strength of the current,

The Combination with Electric Lamps worked in multiple, with the motor in the omnibus wire of all the Lamps.

The use with a monodynamic Motor of a Contact whereby at Each revolution 1 or more Closings of a separate circuit is made such Circuit Containing an Electromagnet operating recording or indicating Mechanism.

The Combin with the monodynamic Motor of worm & worm wheel,

The Electromagnet in main Circuit Closing when lamp put in to close the field circuit,

Mention my other patents where Commutator used & dynamo; difficulty make multiple circuits without great friction & wear parts & heating & ~~necessity very low~~ resistance in armature difficulty attaining sufficient low resistance Etc —]

We tried this at Laboratory & it rotates about once a minute with 1 Lamp on —

Be sure & get this patent upon good shape by my return Thursday

April 1 1883

Fig 4

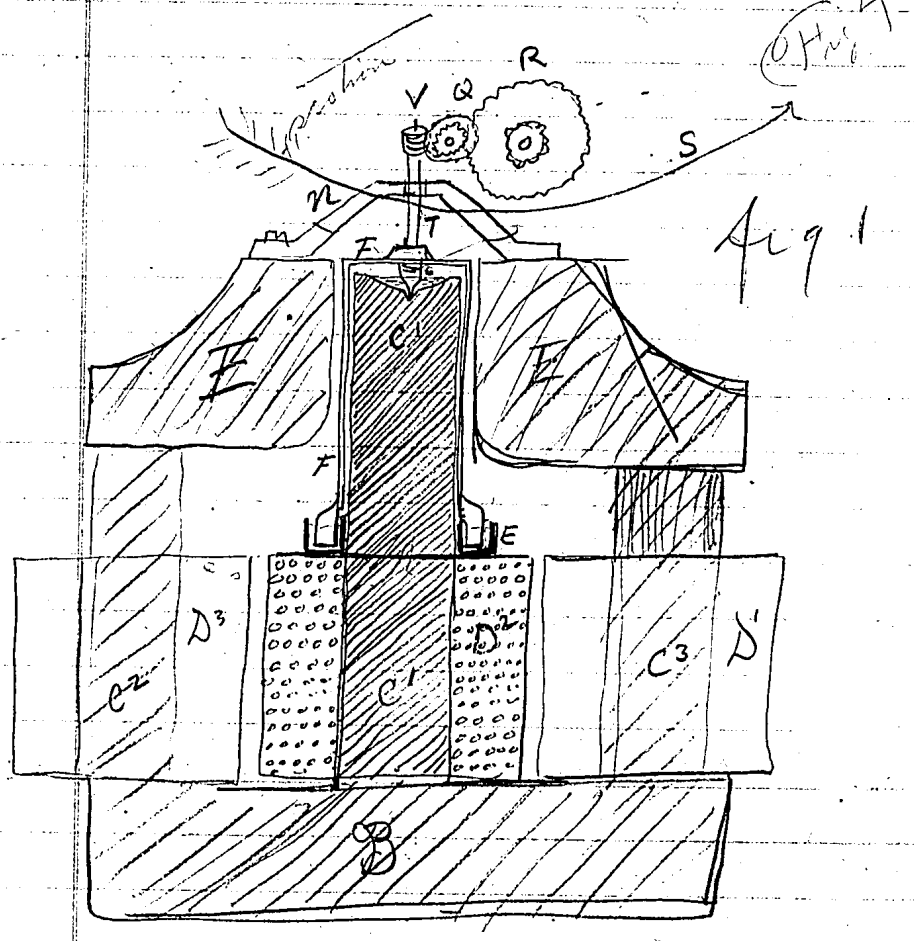


Fig 1

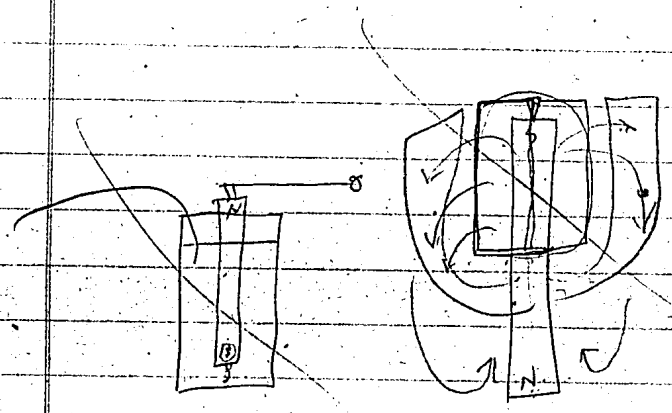
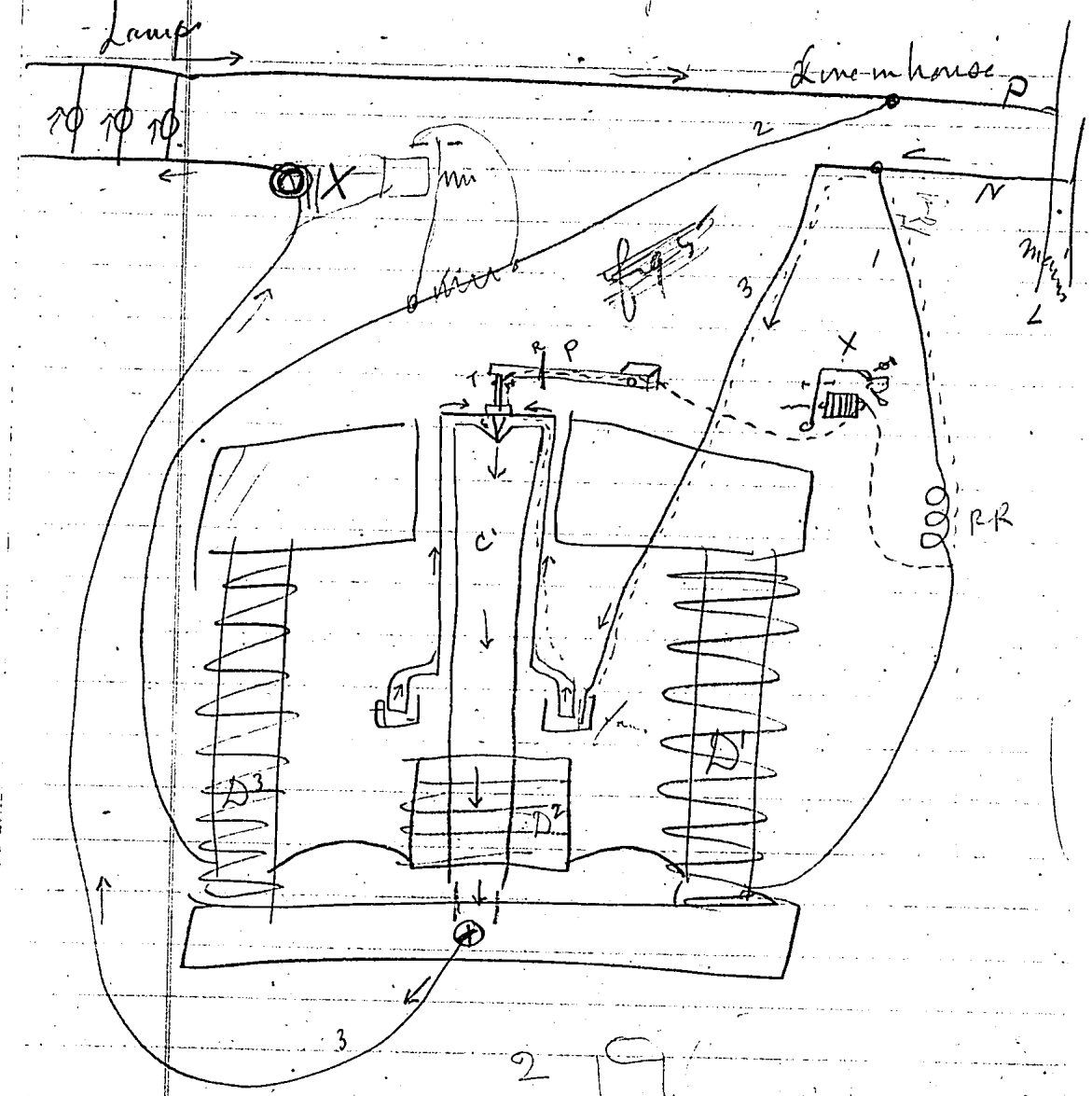


Fig I



Construction of the motor

The Constant field is taken across the house mains in multiple arc. The resistance of the Constant field magnets is very high so that only sufficient Current to Energize the field is used —

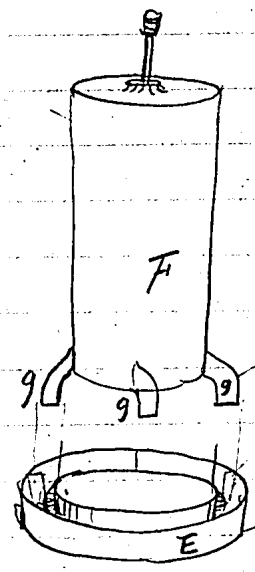


fig 2

Trough containing mercury into which paddles dip. trough may be made of insulating material or metal not amalgamated by mercury

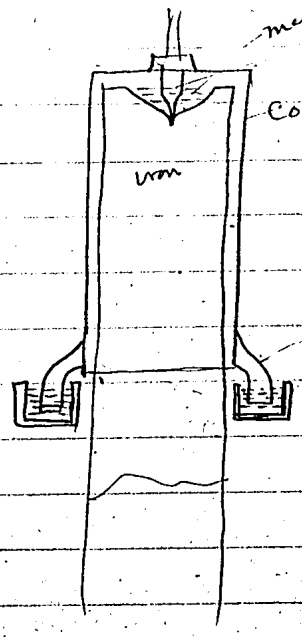
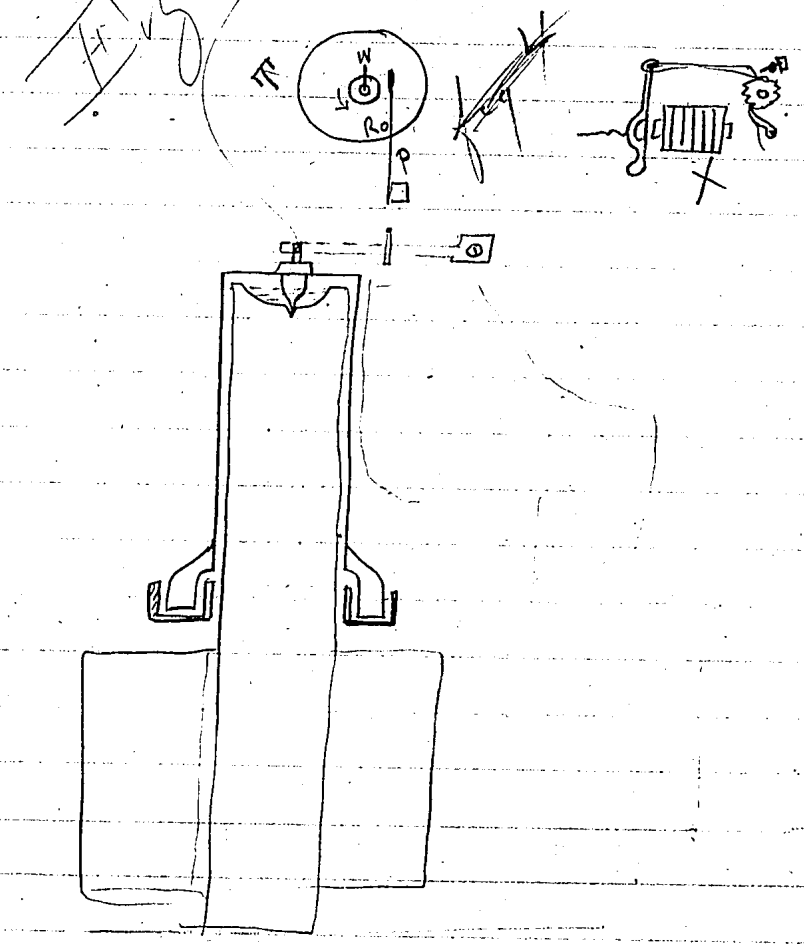


fig 3

Fig 3

Electrical Contact once every revolution;



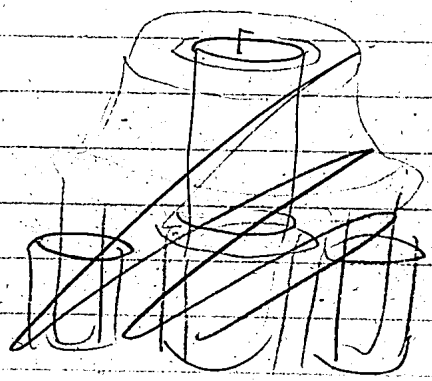


fig 6

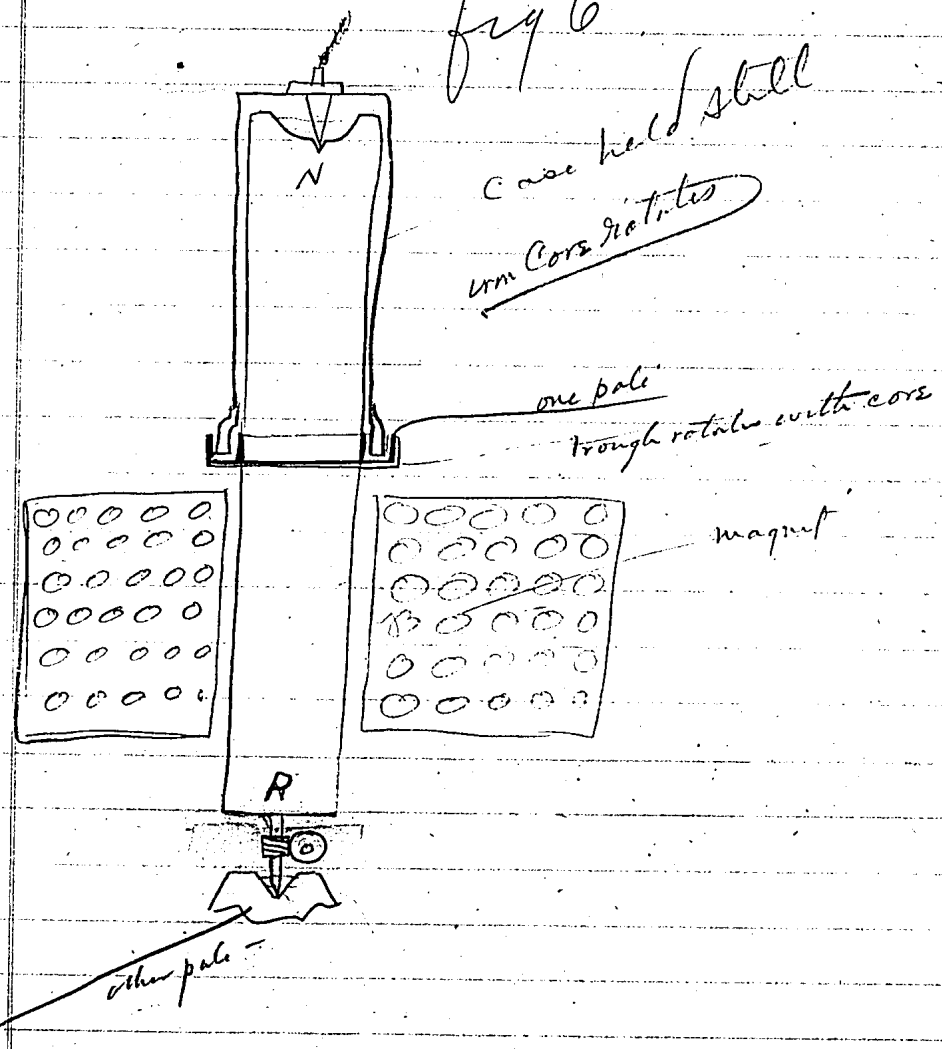
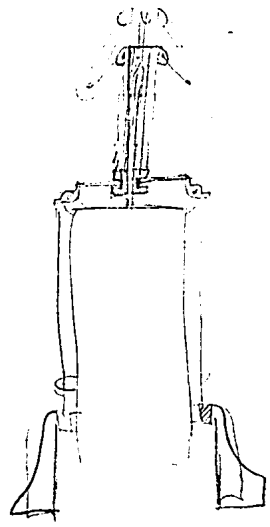
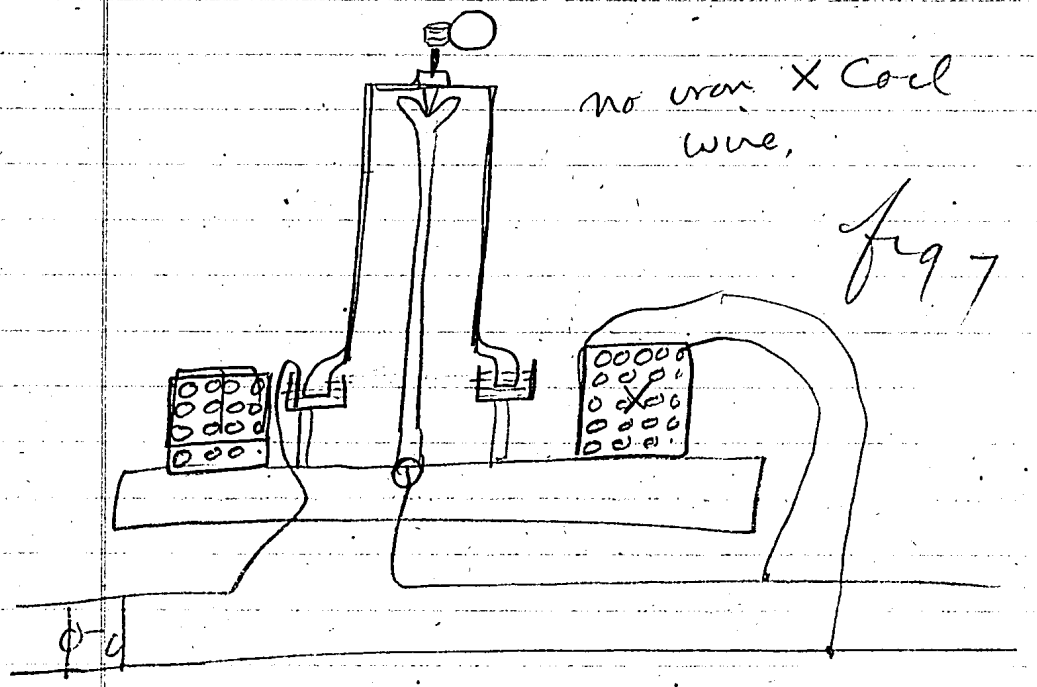

N
case held still
arm Core rotates
one pole
trough rotable with core
magnet
R
other pole

Fig. 1




no iron X Coil
wire,
fig 7
φ-d

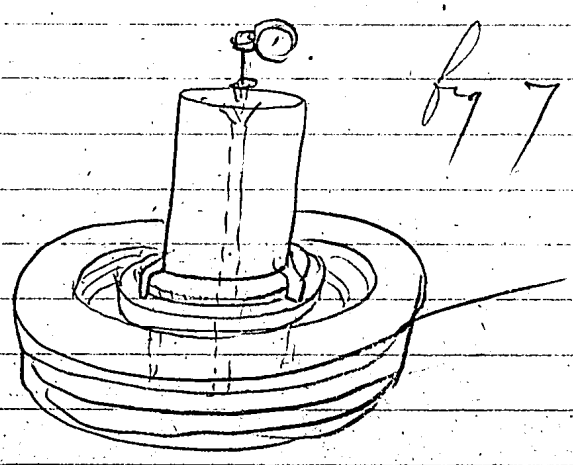
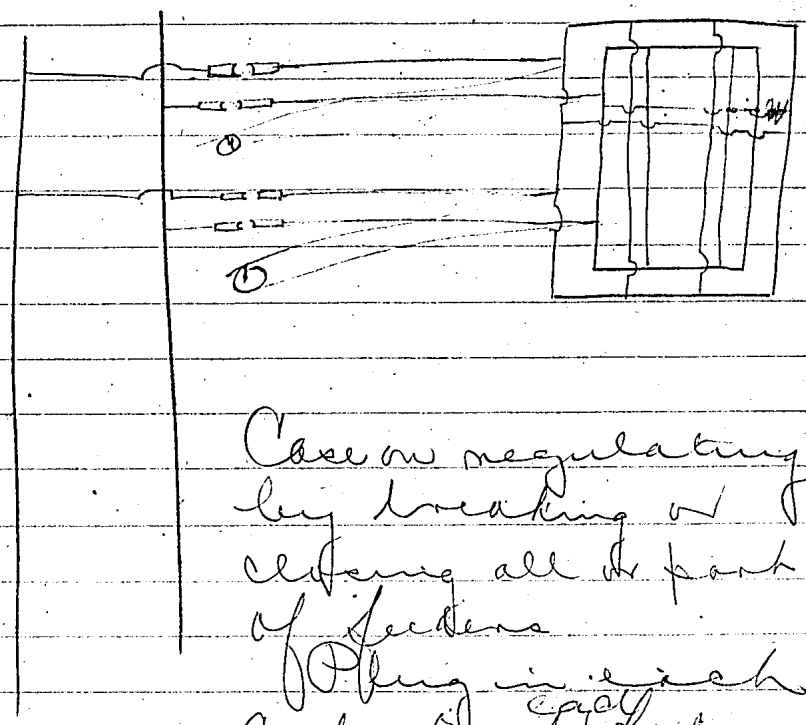


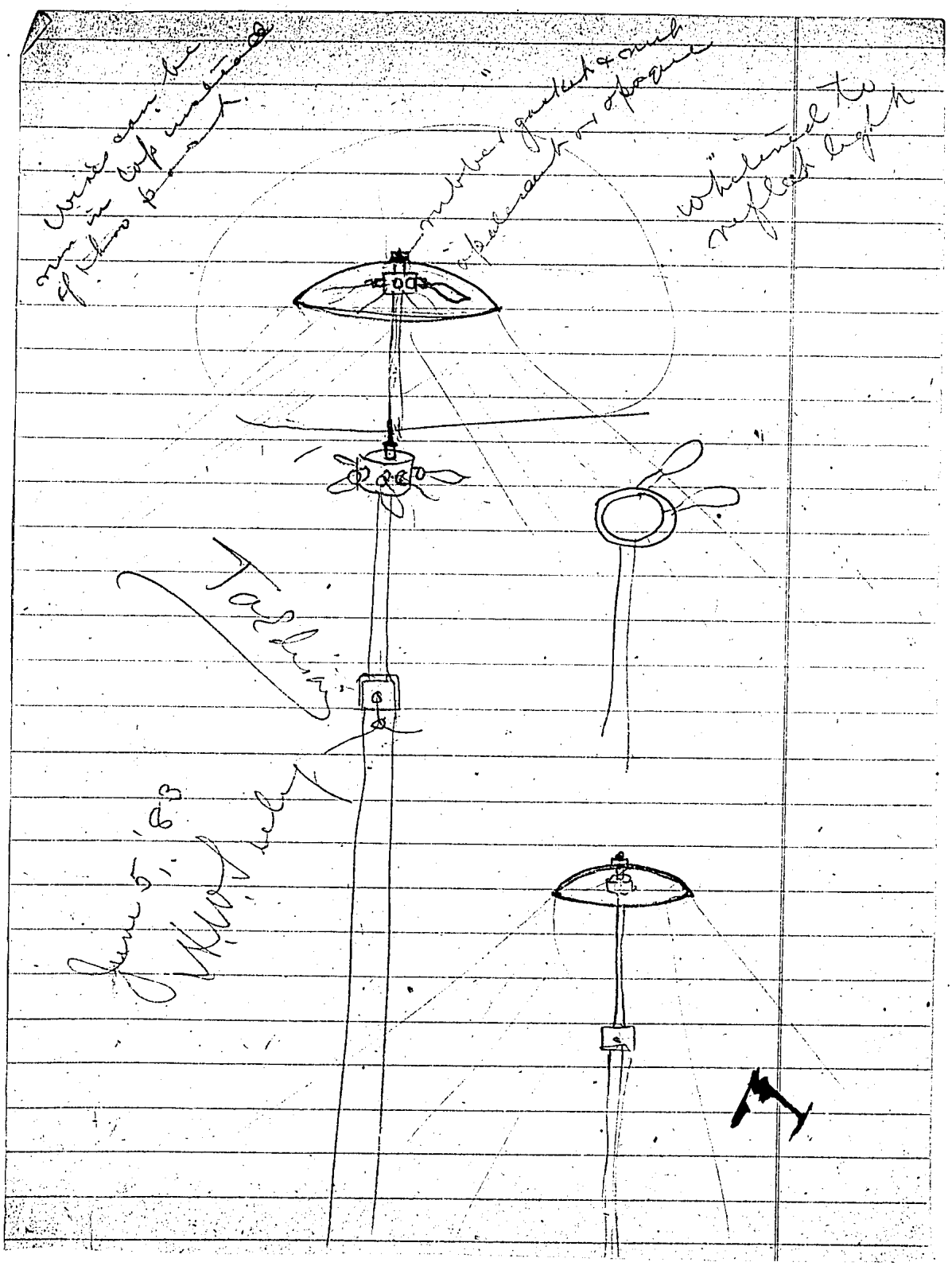
fig 7



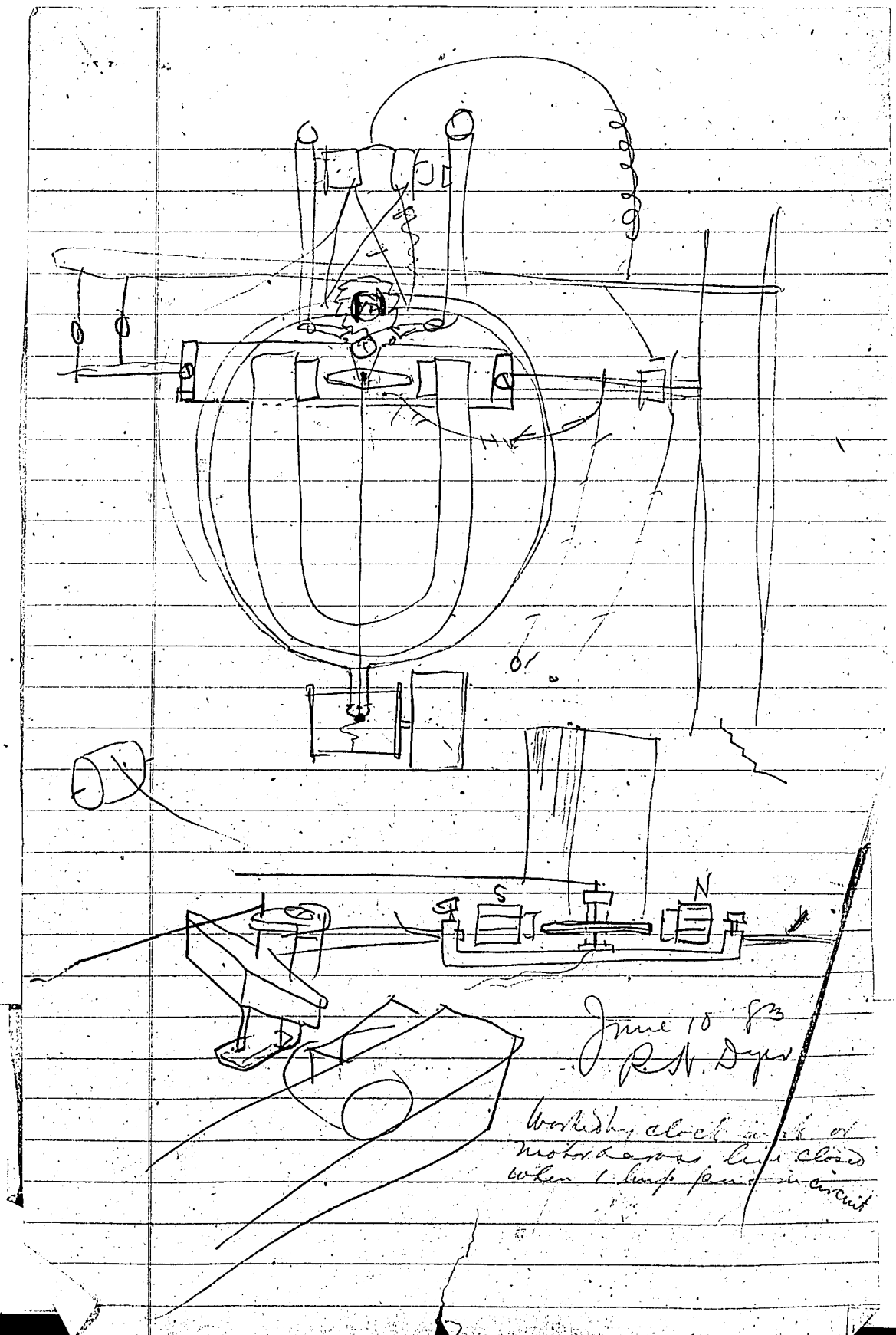
Case on regulating by breaking or closing all or part of feeders

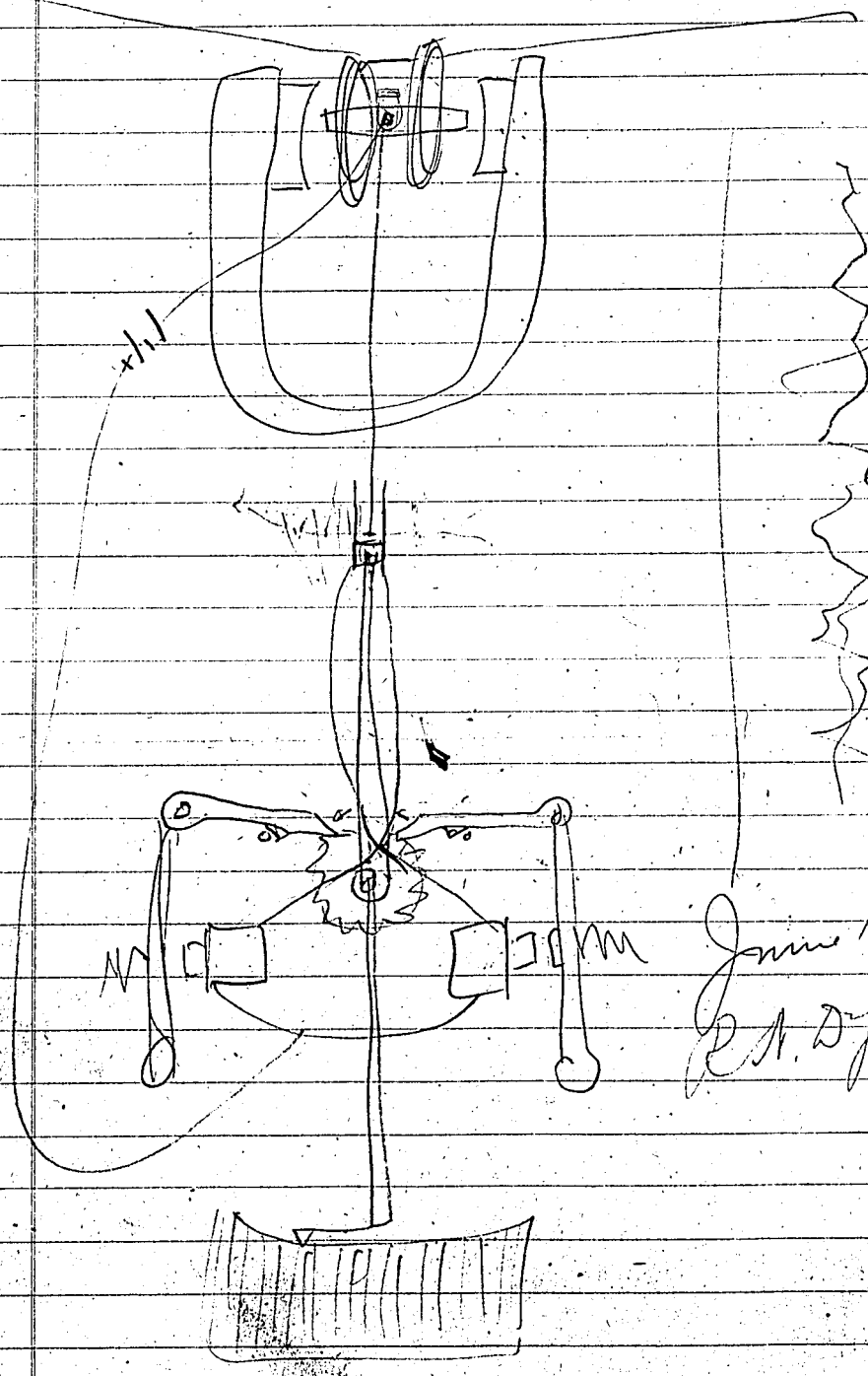
Plug in each conductor of feeder

June 5, '83


Jackson
June 5, 63

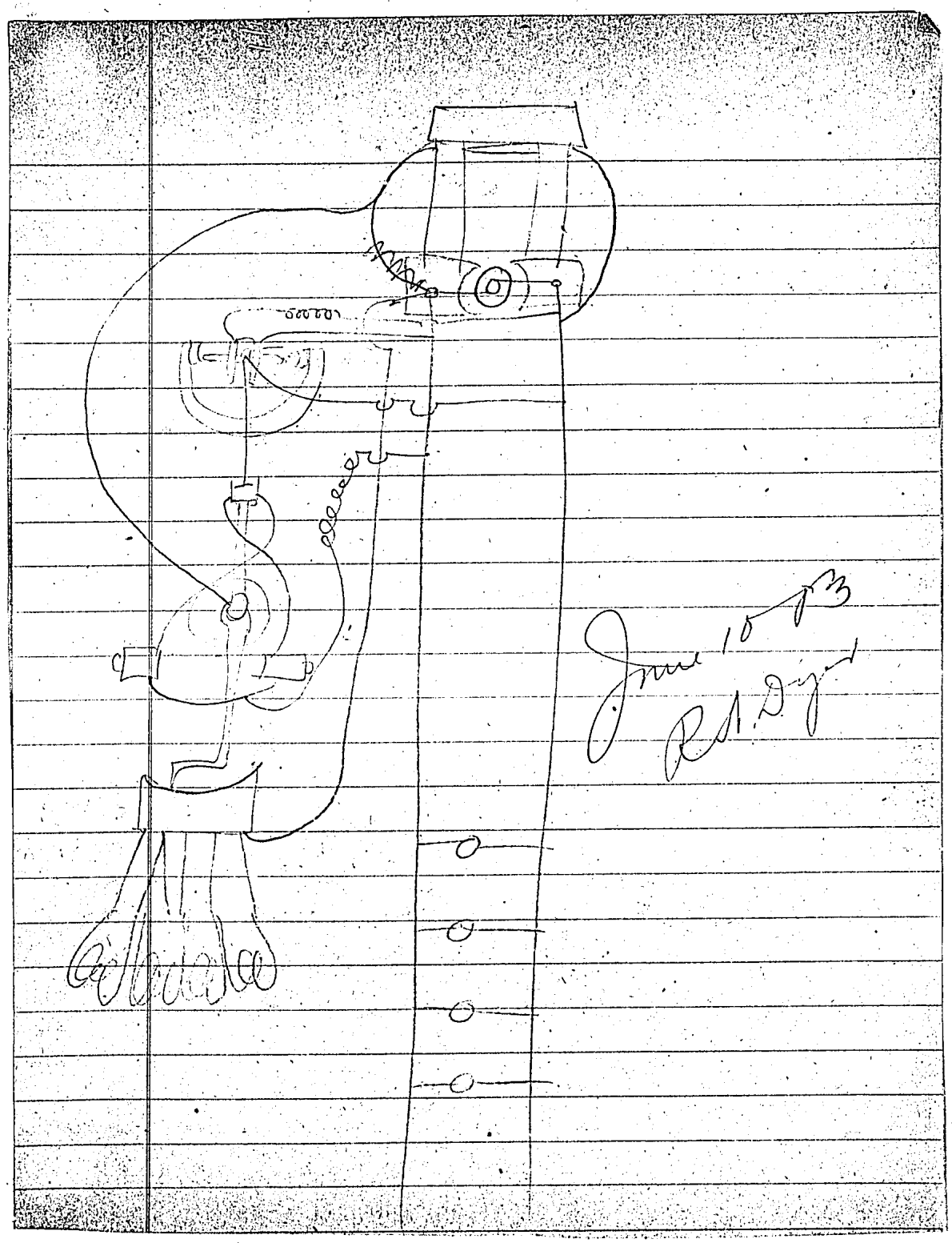
June

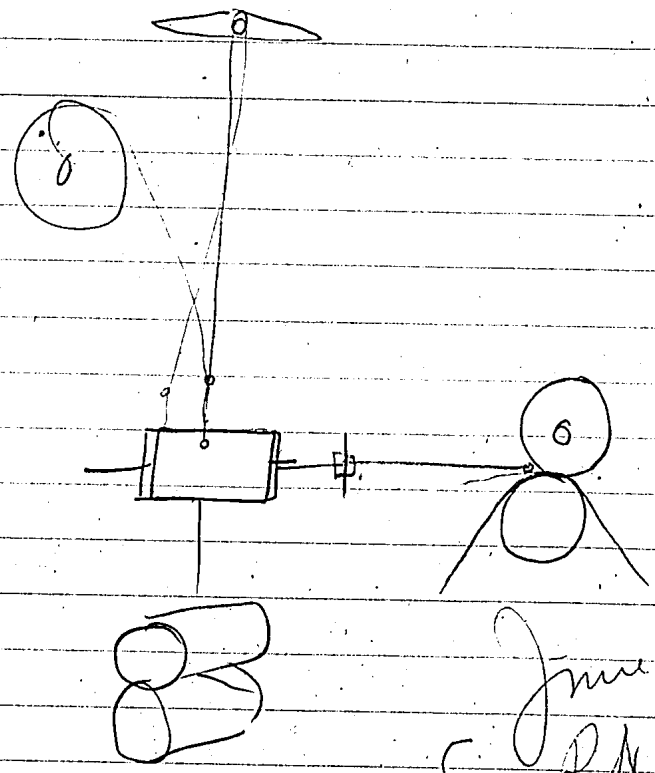

S
N
June 10 83
R.N. Dyer
Working clock with or
motor drives line closed
when lamp part in circuit



June 1883

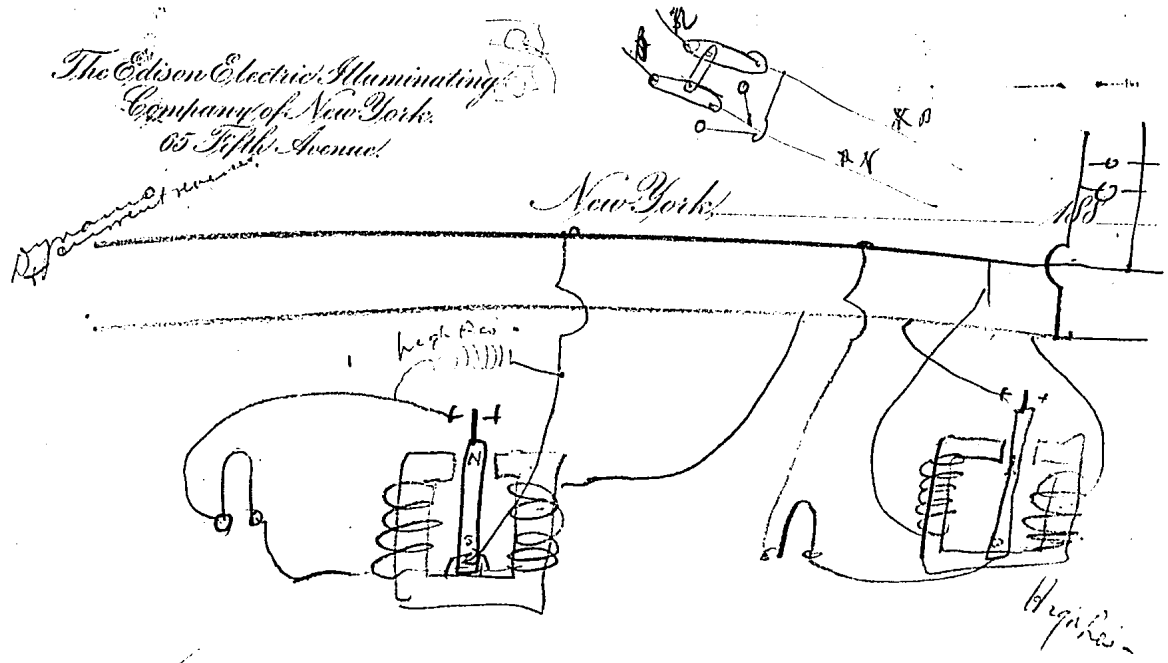
R. A. Dyer.


June 10 73
R.A. Dyer



June 10 P3
P.A. Dept

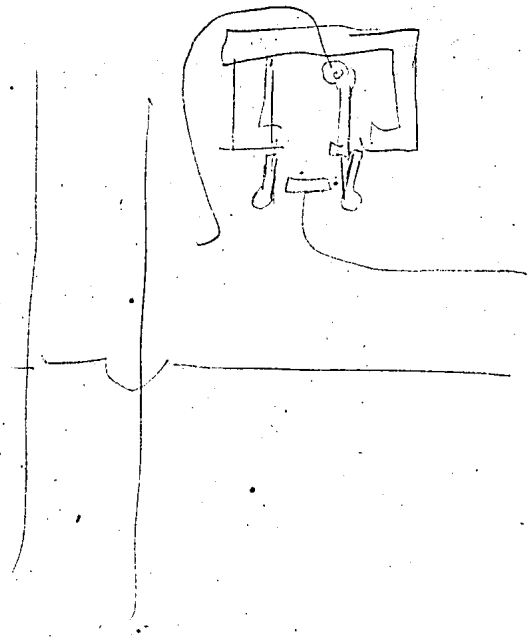
The Edison Electric Illuminating
Company of New York
65 Fifth Avenue



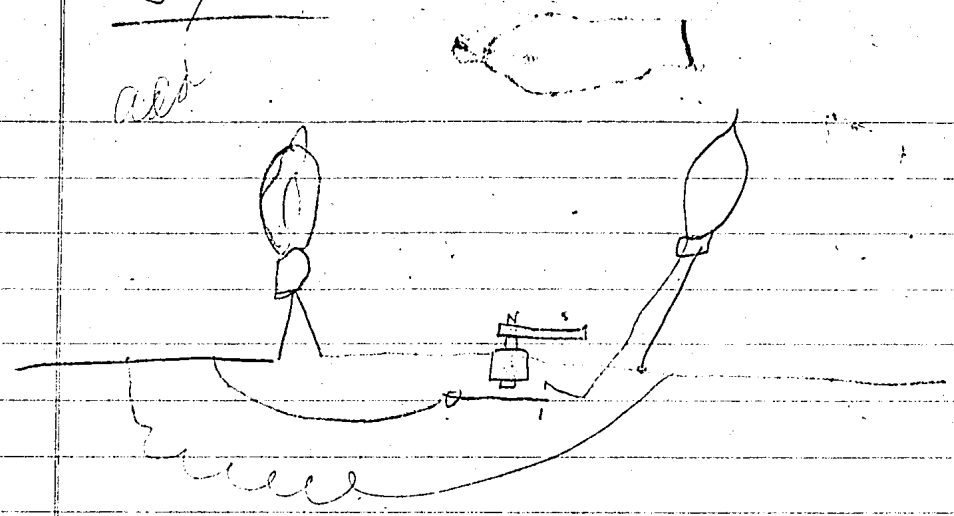
June 11 83
Rob Dyer

Mention that apparatus might be used for working other things. Claim broadly galvanograph in combination with electric lighting system wherein lamps are not affected by changes in current.
Electro-lytic
machines can't be used, but there is no need of making mention of this.

June 22, '83
Wednesday

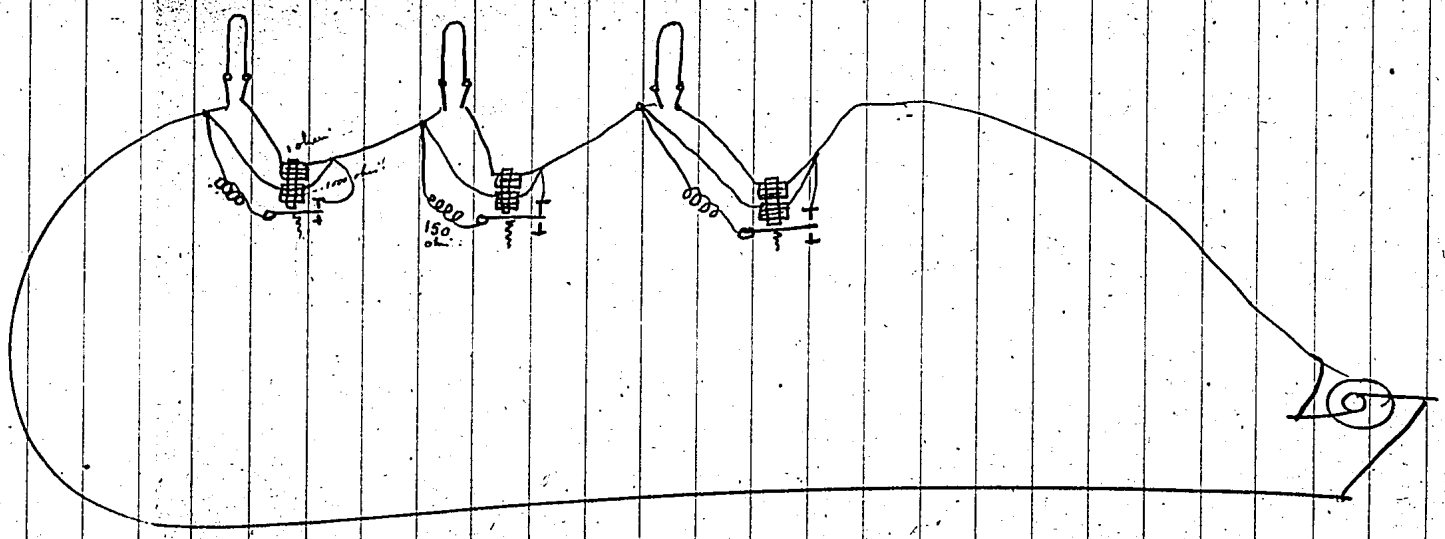


578



June 25, 85

No 1



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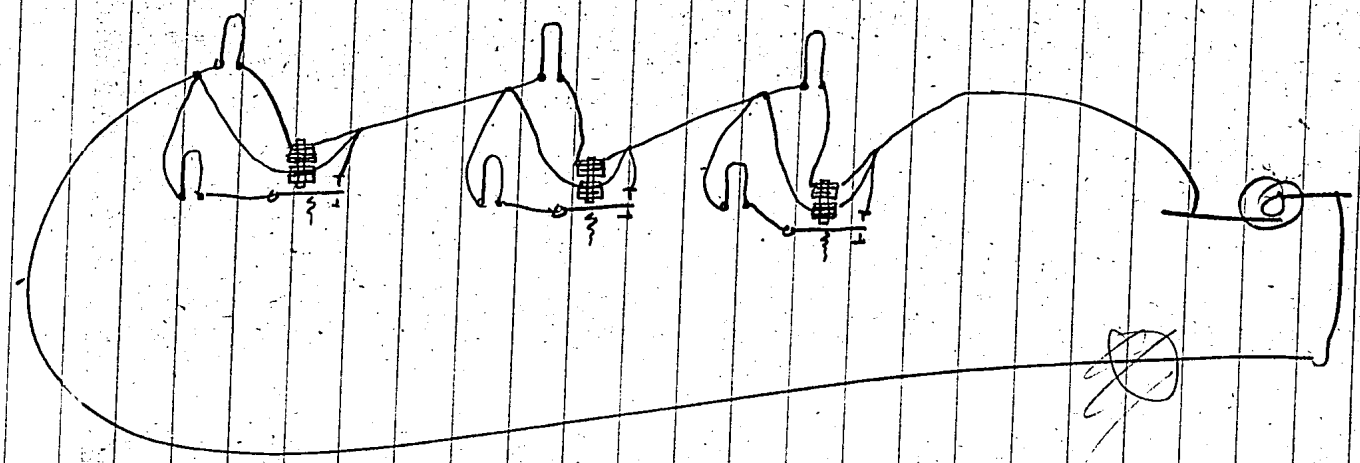

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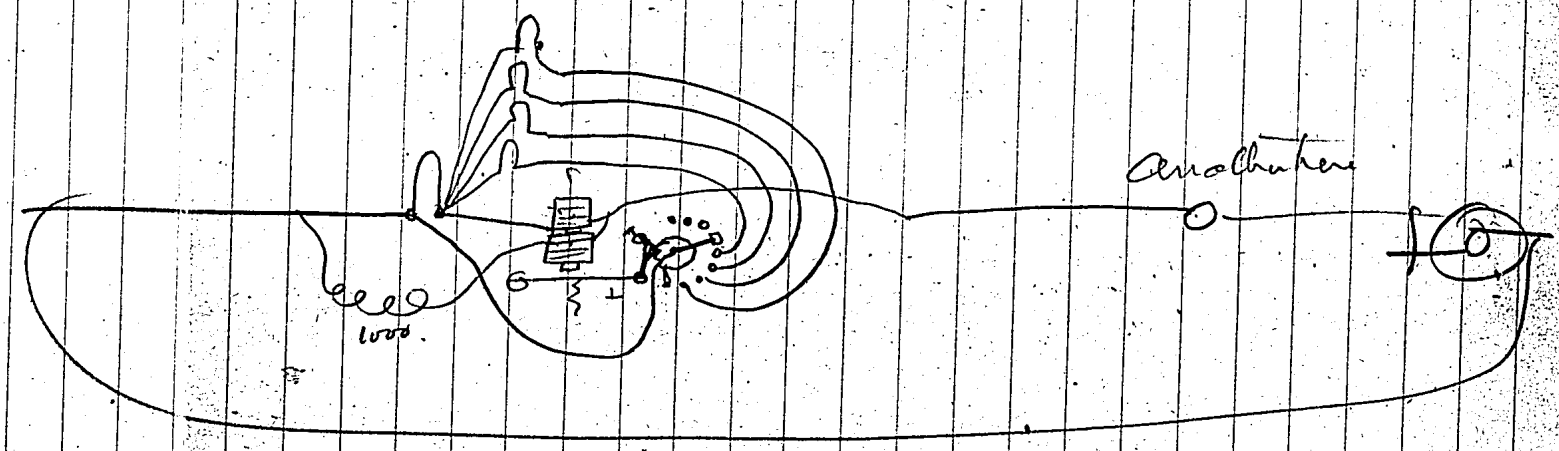
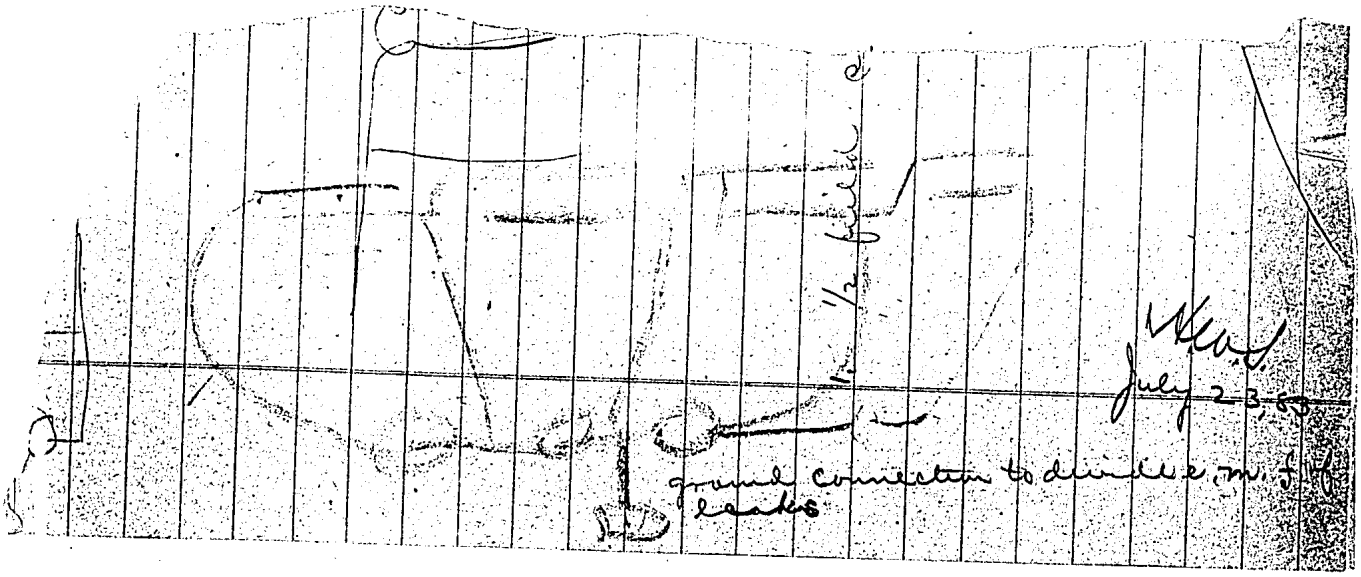


July

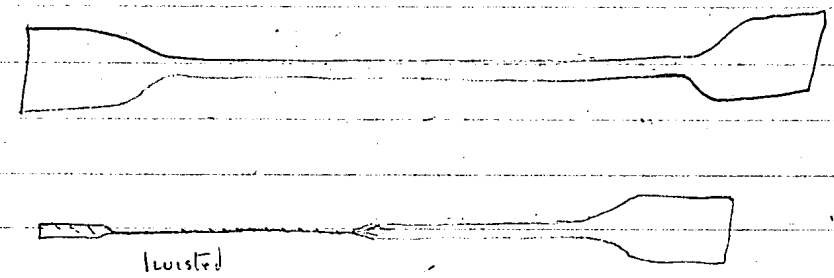


Aug. 2, 83
Ed Cleveland

Twisted tight into homogeneous paper twine

Patent

The invention consists of forming a cylindrical filament for carbonization by cutting out a blank from paper or other organic tissue with broadened ends & twisting the same with a cementing material to form a cylindrical filament with thickened ends



Aug 21 '83 Wunderlich

The flat blank of tissue paper is coated with a carbonizable cement such as gum tragacanth, & twisted together by machinery in a even manner. An alternative is to twist without the cementing material & afterwards gelatinize the portion of the cellulose of the paper by immersion in a solution of hydrofluoric acid to cement the whole into a homogeneous mass.

Claim: The filament ~~of~~ for carbonization made substantially as herein specified —

Will that form of claim cover better than broad specific claim ?? — E

Aug 1883

Aug. 21, 83
A. W. Seely

The object of this invention is to prepare blanks from which filaments may be cut or punched for producing flexible filaments of Carbon for incandescing Electric Lamps.

The invention consists in employing thin pure + evenly made tissue paper rubbing soaking several pieces of the same in a thick mass of gum tragacanth, ~~Resin~~ or other suitable Carbohydrate, or viscous substance carbonizable without entire volatilization then place 2 or more sheets of paper together + drying the same under steam + pressure to produce a perfectly even blank — ~~the grain~~ paper having a grain one sheet is laid on the other so the grain shall be at right angles, a modification of this invention consists in treating each sheet simultaneously with Hydrofluoric acid + then immediately putting them together as stated, drying under steam + pressure.

Claim: a blank for cutting filaments for Carbon from consisting of 2 or more thin sheets of paper secured together by a carbonizable cementing compound for the purpose

2nd — Drying under steam + pressure.

3 across the grain —

producing the cementing by acting on the sheets therewith ~~Use of~~

Fig 1

Fig 2

Fig 3

Covering of [illegible] japanned or nat—

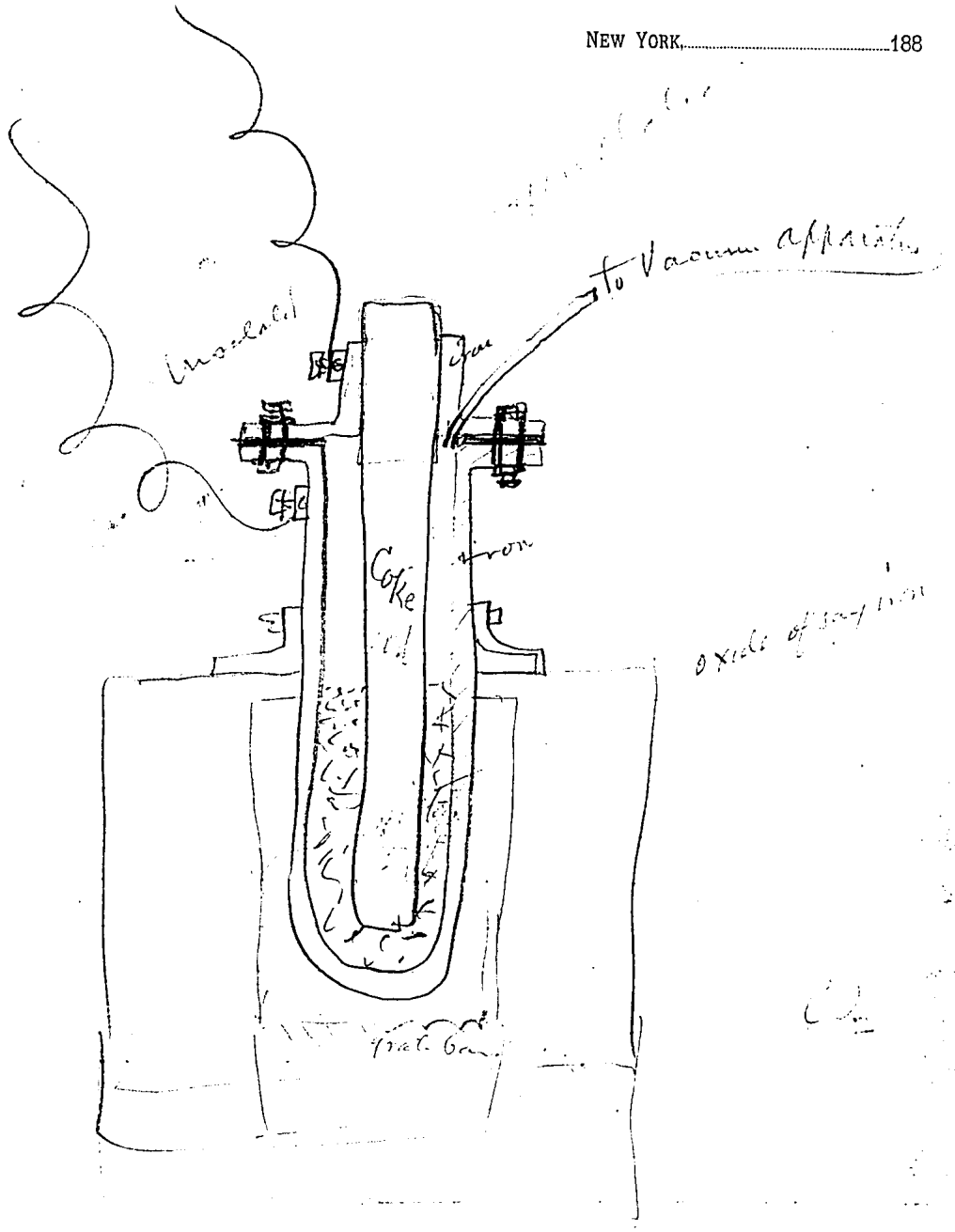
Retaining covering of braided or wound [illegible] or other material [illegible] paper [illegible] to. Non ~~conductors~~ insulation to prevent escaping by high tension induced current, wire or any part or number of wires included in same wrapping.

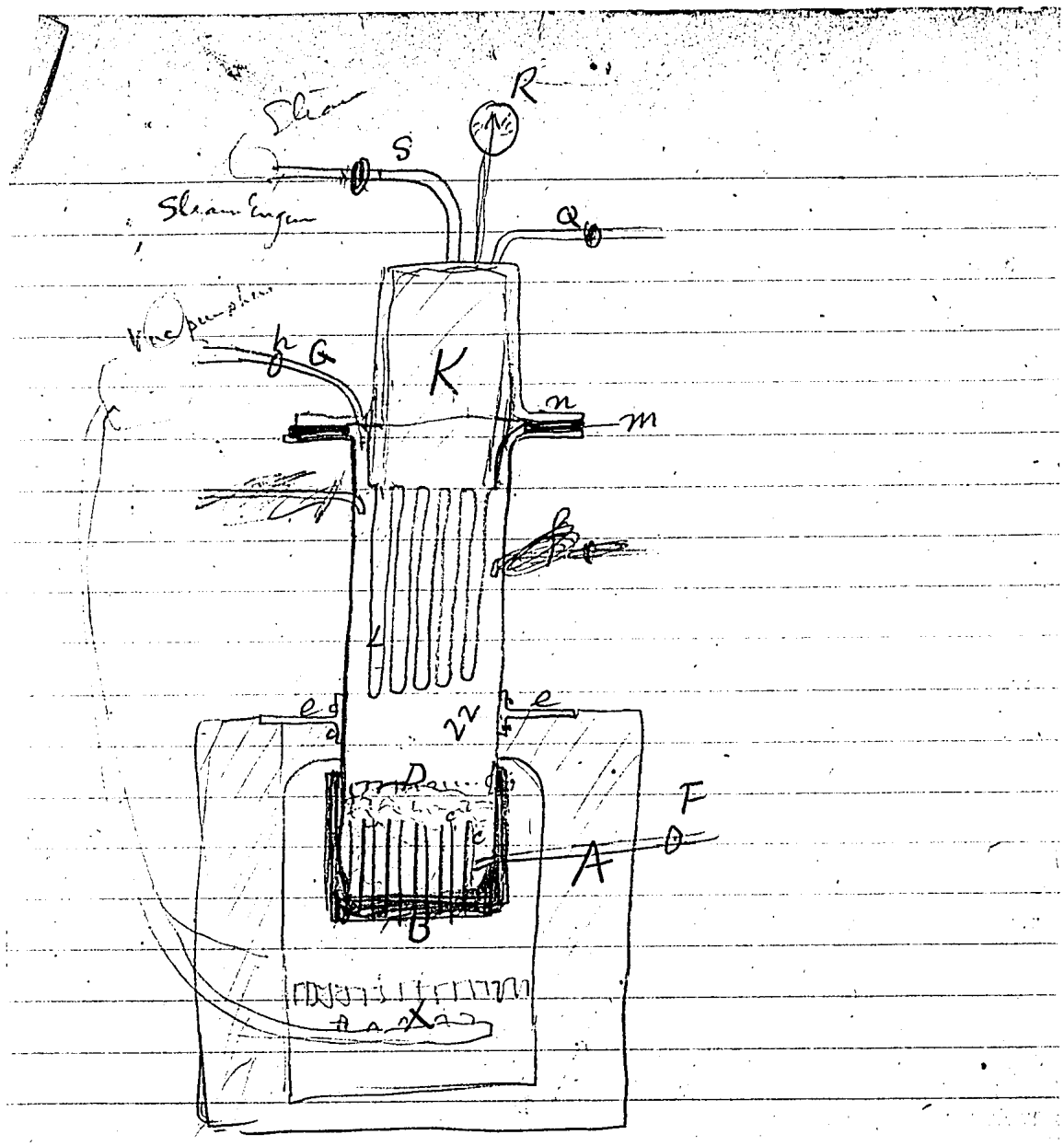
Paper in combination with braid spirally with overlapping edges.

Aug 31, 88

THOMAS A. EDISON,
No. 65 FIFTH AVENUE.

NEW YORK, 188





Sept 1st 1883
Witnesses
Rich H. Dyer
[illegible]

Sept 7 83
Rec'd Appl
Huntley

The object of this invention is to produce Electricity from the ~~dry~~ oxidation or reduction of a reducing or oxidizable substances such as ~~an metal~~ or Carbon + an oxide of a metal,

The invention consists in oxidizing the oxidizable substance in an exhausted chamber, formed of two insulated conductors or collectors of the two electricities set free by the decomposition + oxidation.

The invention further consists in assisting oxidation + decomposition by the application of heat exterior to the chambers

The invention further consists in causing heated electrified gas produced by combustion + decomposition within a closed chamber to become a good conductor of electricity by means of keeping the rarefication of the gases of the chamber at a point near a vacuum + thus cause the practical utilization of the electricity produced by dry combustion by causing continuous current of great

Sep 13 1913 Rec'd Wordsley

Volume to be set up—

The invention further consists in absorbing the waste heat of the chamber by water to form steam to give motion to the steam machinery which keeps of a continuous process of exhaustion of the gases from the chamber to pump water to the chamber to supply that lost by formation into steam + the utilization of the hydrogen or carbonic oxide given off to heat the chamber

The invention further consists in ejecting water vapor into the vacuum chamber upon the incandescent combustible substance to produce a decomposition of the water by the reducing action of the incandescent metal + thus set free the two electricities ~~and the~~ or the equivalent of mixing with the carbon an oxide of a reducable metal its oxygen combining with the carbon to form carbonic oxide which passing to the insulated chamber giving electricity to it of one polarity while the reduced metal retaining the electricity of the opposite chamber remains to charge the other chamber

Inv. B
Pat. 7 8 1 Sept
H. Wesley

A is a furnace
x grate bars
22 a flanged boiler tube with a thick cast iron head B. on the inner surface of which are iron rods projecting upwards & between which the carbon D is packed

K is the other chamber with water tubes L projecting down into the chamber 22. The 2 chambers are insulated from each other at the flanges N by asbestos packing & cement at M. This forms a closed chamber containing the ~~Oxidizable~~ powdered metal K is filled with water by the pipe Q which is connected to a feed pump R is a steam gauge
G is a metallic pipe passing through K but not insulated therefrom & passes into the chamber 22 This pipe is connected to a vacuum pump worked continuously by steam
f is a pipe for allowing water vapor or steam to pass into the chamber & come in contact with the incandescent ~~metal~~ The ~~carbon~~ carbon being brought to incandescence by the furnace.

~~Claim~~
~~Art of~~

Several of these chambers may be connected in series the part 22 being connected to the part K of the next chamber or they may be connected in multiple arc.

When water is not used Oxide of Lead may be mixed with the carbon ~~in the case~~ anthracite Coke or Lampblack or charcoal may be used ~~with the~~ all these forms of Carbon including anthracite Coal become Excellent Conductors when incandescent although the latter is not a conductor when cold. When an oxidizable metal is used gran

Claim - Improvement in the art of obtaining electricity sub as described

The Method, + all the broadest claims that a new + novel method will point yet make.

E

Electrical Pressure Indicator

Dear =

I have just completed a pressure indicator which works perfectly X X' are the coils Copper wire L is heavy steel needle magnetized it is secured on a torsion wire T which has its torsion increased or diminished by turning the smooth stud M round this is held by friction the cross piece being split & 2 screws 3 + 4 used = K is a spring which keeps the wire T stiff P is a nut for increasing or diminishing the spring — Q is an index straw. The torsion of the wire keeps needle at zero —

2

LM is a regular lamp in addition there is a strip of of platina R which is secured to a wire & passes through glass, one end is connected to the galvanometer the other end of the galvanometer is connected to the pole of the lamps upon which the blue halo appears; when the lamp is brought up to incandescence a ~~current~~ constant current of considerable power passes through the galvanometer wire & deflects the index - The scale may be graduated to read Volts or candle power - A Resistance M. may be put in with the lamp & adjusted so as

3

to standardize the lamps to raise & lower in candle power like those on the Circuit - It is very sensitive ~~up to~~ with regular lamps it differs very little until you reach 12 candles ~~after that each candle~~ after that it is more nearly proportional to the candle power - In fig 2 I show 2 lamps one runs all the time while the other is used to be thrown in circuit to see that the regular one has not varied -

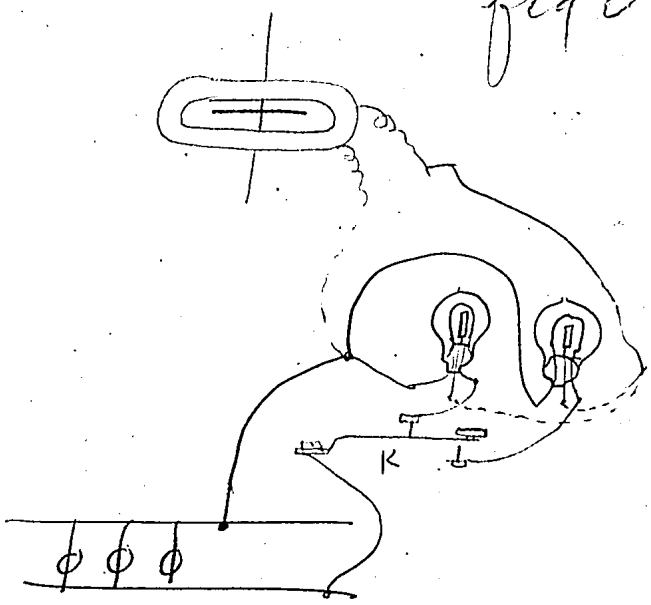
Want broad claims on using the current given out by ~~[illegible]~~ Vacuum Lamps for this purpose & other purposes This is absolutely new novel -

E

Ny. Oct. 13, '83.
Wesley

Sig. Oct. 19, '03 Newbury

fig 2



Sig. Oct. 19, '03 Newbury

fig. 3

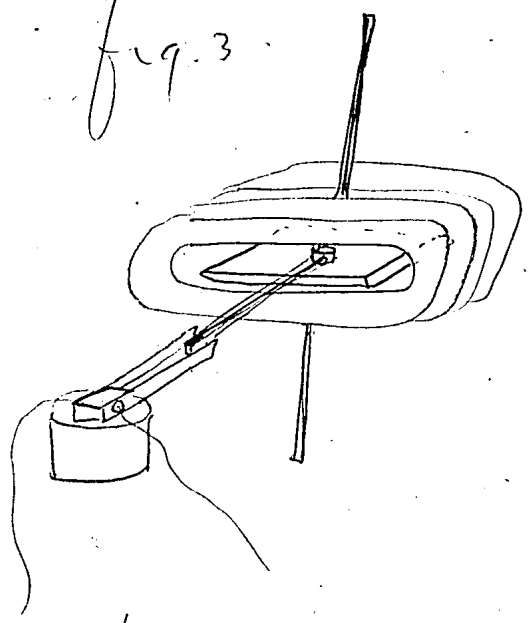
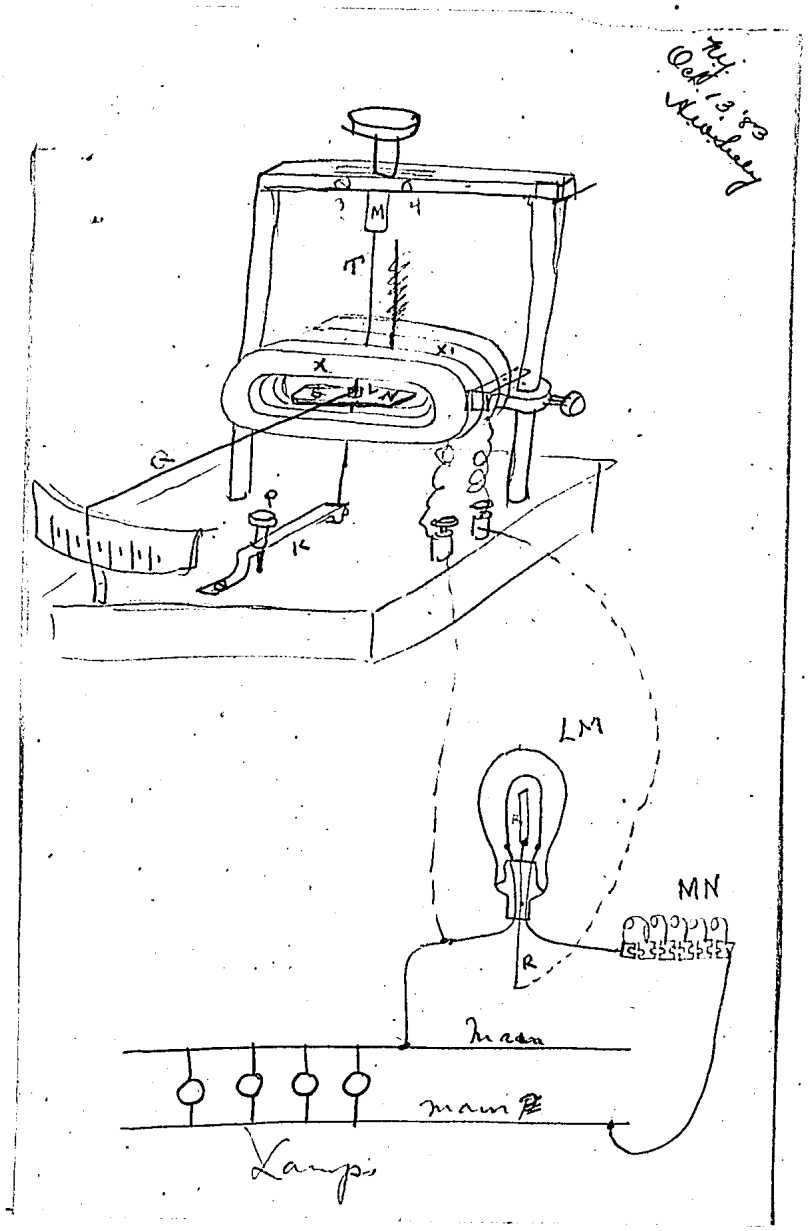


fig shows how it can be arranged to close the circuit for working auto Regulator & perform other things

—October—1883.—



BERGMANN & CO.

ELECTRICAL WORKS,

SOLE MANUFACTURERS OF

FIXTURES AND APPLIANCES

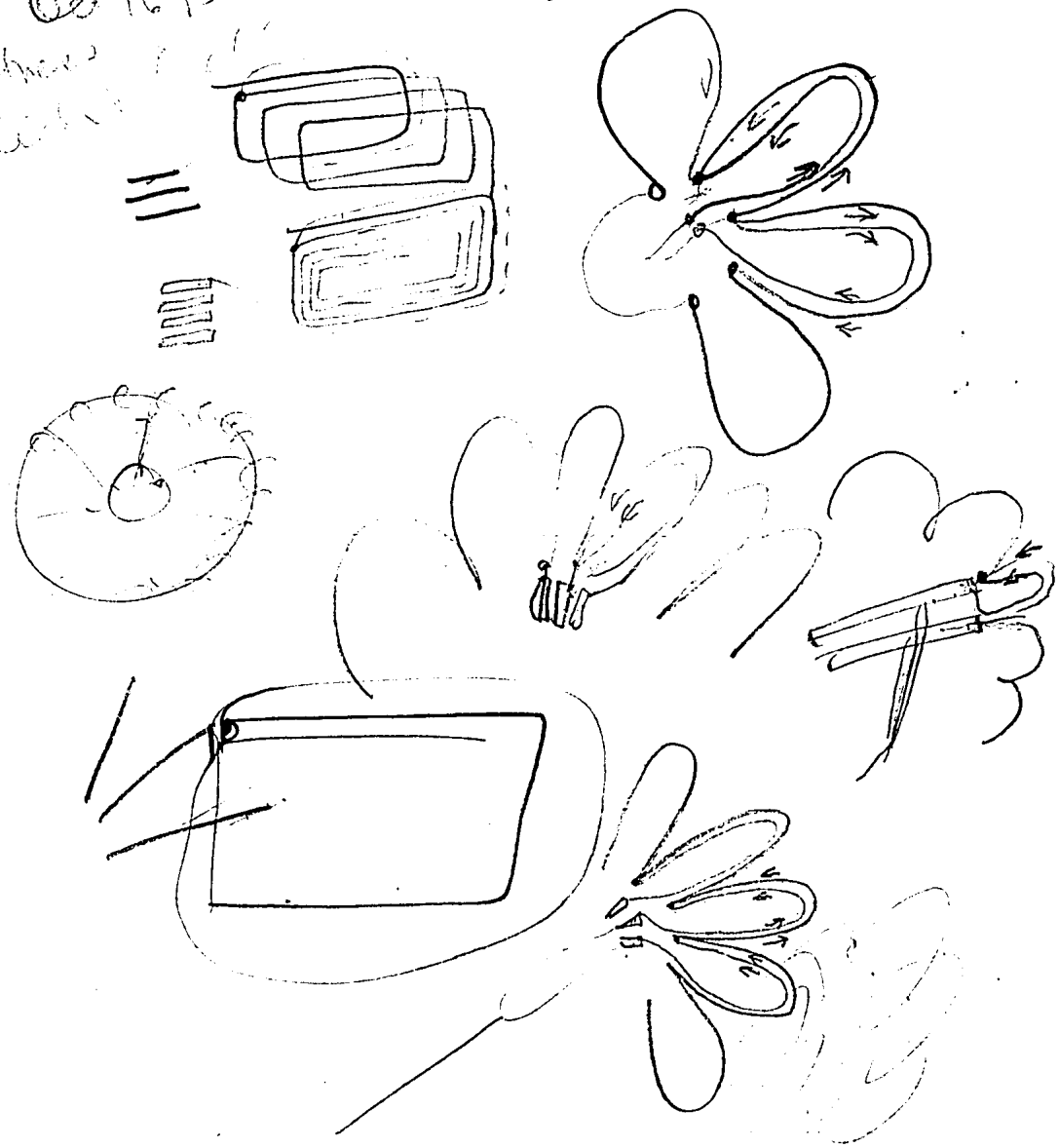
FOR THE

EDISON ELECTRIC LIGHT.

Nos. 292 TO 298 AVENUE B.

New York, ... 188

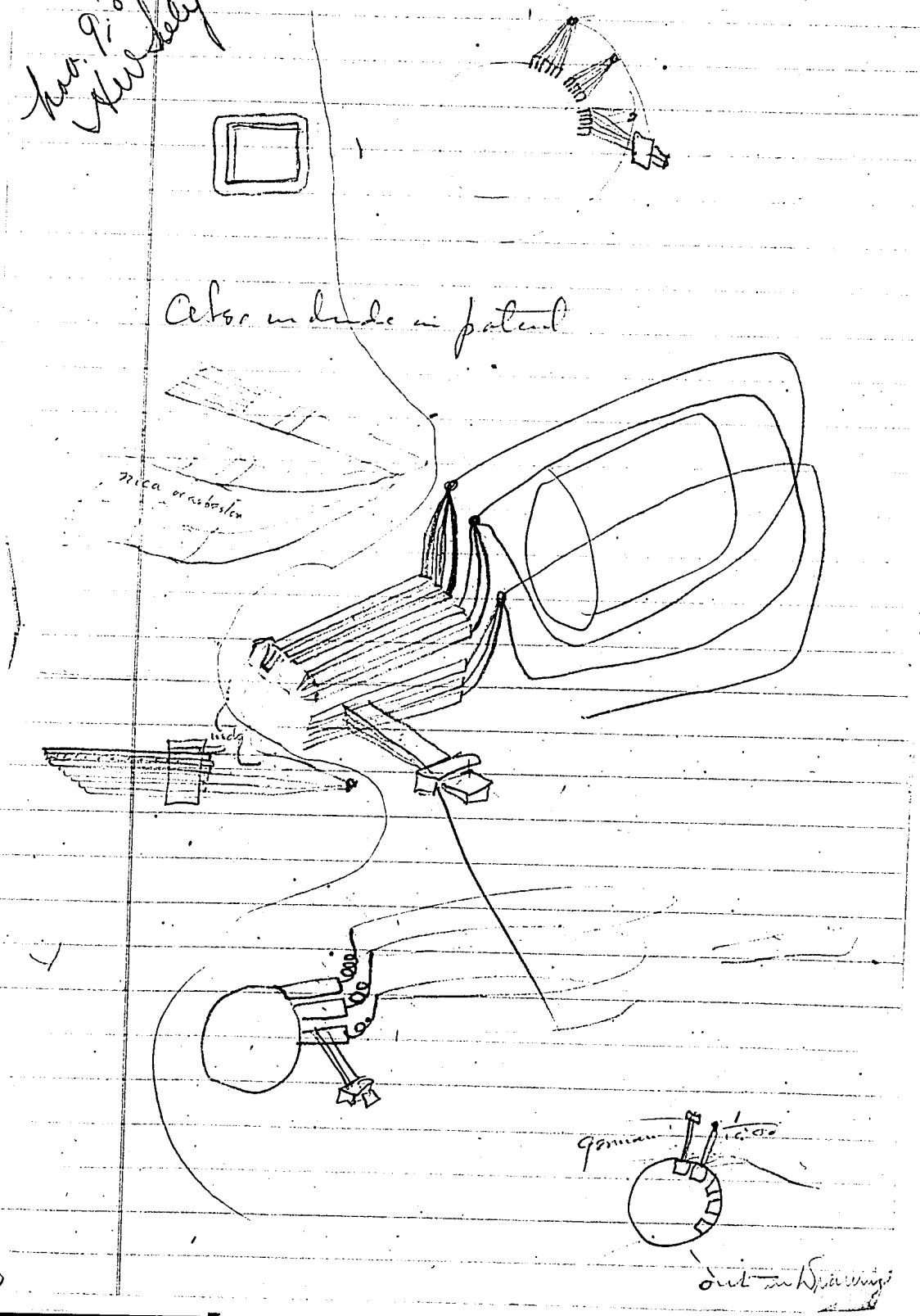
Oct 16 13



— November 1883 —

276,233
Apl 24, '83

Nov. 9, '83
Newbury



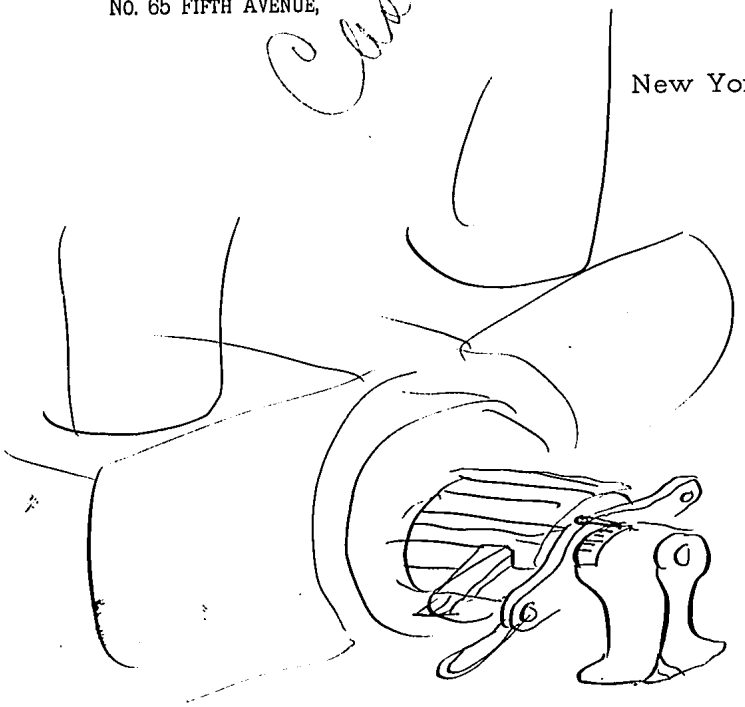
Form L.

THOMAS A. EDISON,
Central Station, Construction Dep't,
No. 65 FIFTH AVENUE,

Cable

New York, Dec. 18, 1883

N. W. Kelly



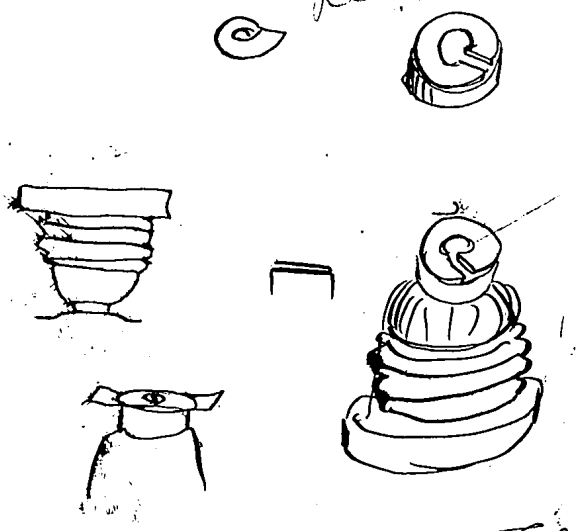
Patent

Scale in amperes. The sparking point of the machines depends directly on no. of amperes. By using these brushes are adjusted you know the load in machine.

Especially when 2 machines of diff. capacity work. L. & Smith been asked they wanted give same C, and consequently are burn out.

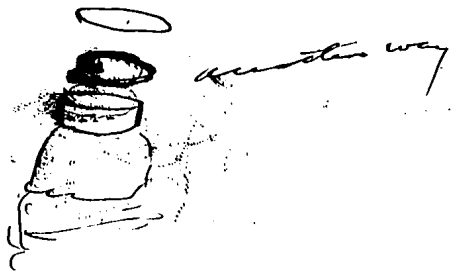
Dec. 10 83

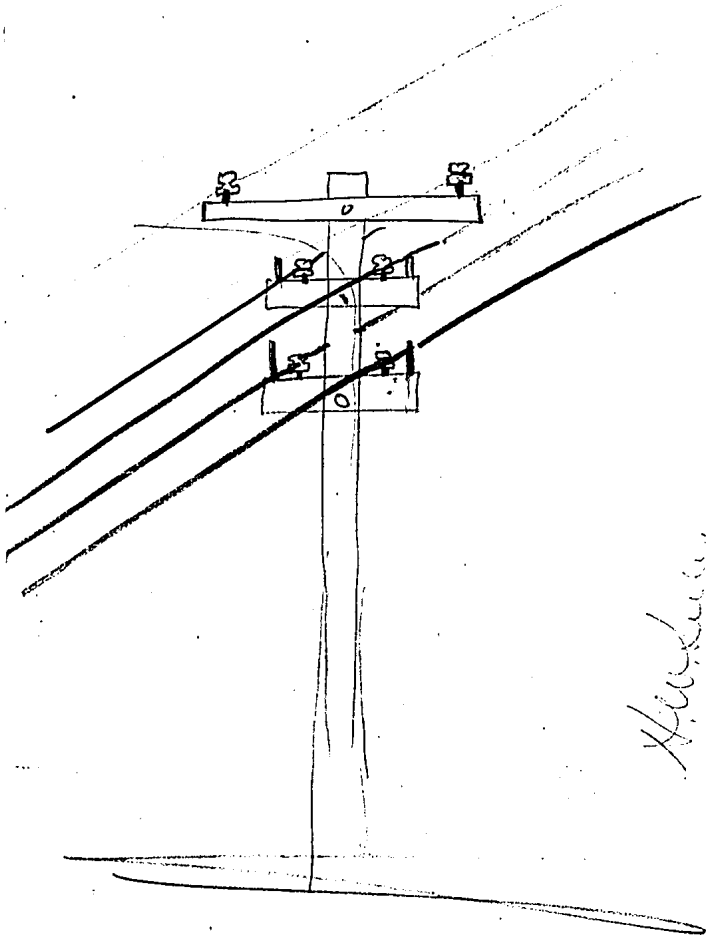
Witness
Richard Dyer

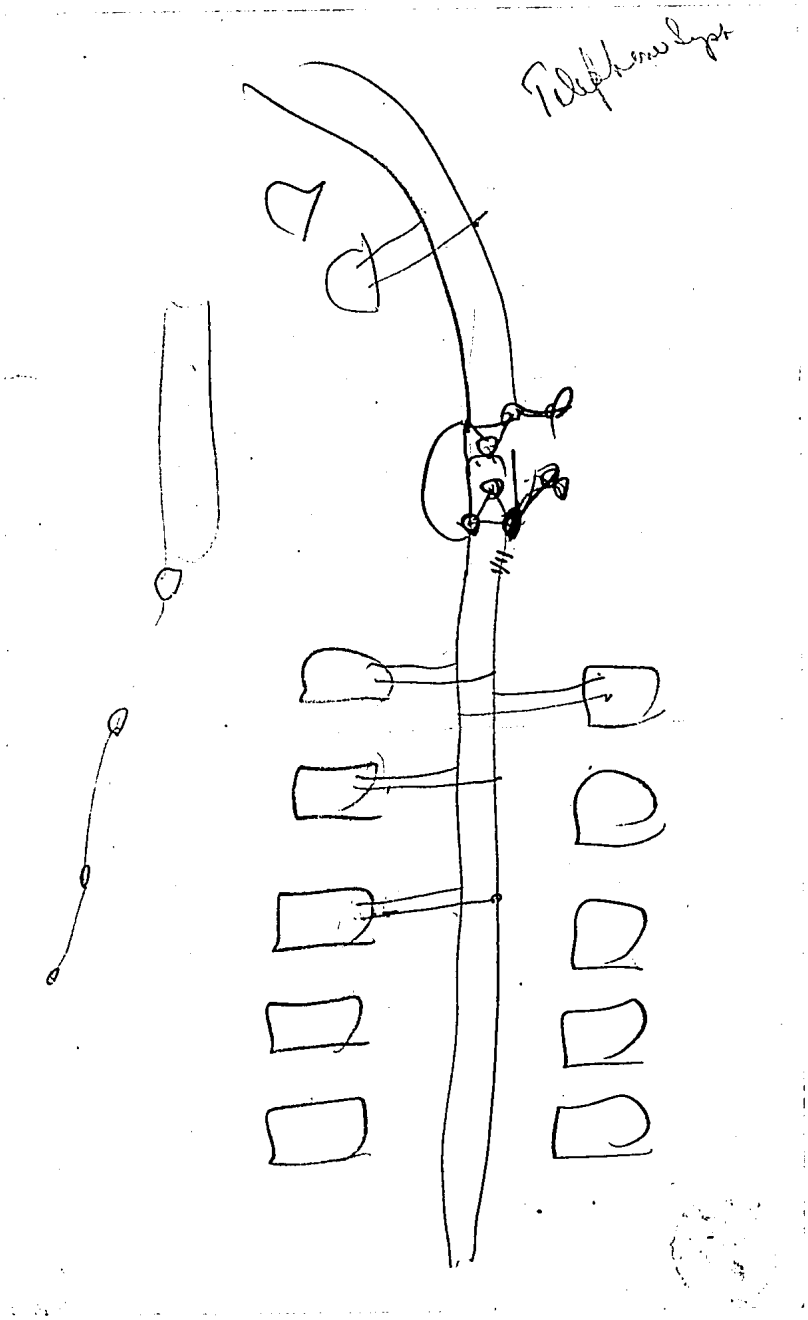


Lamp — safety Catch

etc






Telephone Lyre

Stat. electrometer N.G.

Volts start

increase above
obtain candle
power. More
current due
to decrease
rest.

5 volts on 16
candle 100 candle
lamp.

Decrease nearly
proper to candle
power.